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THE ASSOCIATION OF DIABETES AND TUBERCULOSIS*

Epidemiology, Pathology, Treatment and Prognosis

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INTRODUCTION

studying 245 cases of associated diabetes and pulmonary tuberculosis the following appeared outstanding

The development of pulmonary tuberculosis in juvenile diabetics occurred more than times as frequently as among non diabetic Massachusetts grade and high school children

Pulmonary tuberculosis developed in 8 per cent of diabetic patients within three years recovery from coma

The incidence of pulmonary tuberculosis in adult diabetics is increasing despite the general decrease of tuberculosis mortality with frequent reduction of contacts in the community

In 85 per cent the development of probable tuberculosis appeared to follow the onset of diabetes

such a predisposition to the development of pulmonary tuberculosis is induced by diabetes mellitus, an explanation should be sought answers to certain hypothetical questions

Does diabetes itself by reason of its metabolic disturbances so change the tissues as to provide a culture medium especially favorable

for the development and propagation of the tubercle bacillus? Or does diabetes lower the resistance and prevent the development of immunity to tuberculosis?

(2) Do diabetic families have inherited predisposition to tuberculosis as well as an inherited diabetic tendency?

(3) In the cases so far reported has there happened to be an exceptionally frequent contact with open tuberculosis in family or friends?

(4) Does diabetes chance to develop in persons whose habits of life occupation and economic status favor the development of tuberculosis?

All students have agreed that diabetes does not develop in patients with tuberculosis more frequently than in the non-tuberculous population. For a demonstration of the incidence of pulmonary tuberculosis in diabetics one must consider not only varying standards of diagnosis varying social conditions in communities from which cases are reported but also more important still the remarkable changes in mortality rates for each disease observed during the last 50 years

2) MORTALITY FROM TUBERCULOSIS AMONG DIABETICS AT AUTOPSY

During the latter half of the nineteenth century the diabetic patient appeared doomed to die of pulmonary tuberculosis if he succeeded in escaping coma. In 1883 Bouchardat, the great French student of diabetes stated in his text that at autopsy every case of diabetes had tubercles in the lungs. Earlier in the century Griesinger¹ had found tuberculosis in 42 per cent of 250 diabetics and Frerichs² found in 55 autopsies 21 cases of pulmonary tuberculosis

Windle³ is frequently quoted as stating that in over 50 per cent of 333 diabetic autopsies pulmonary tuberculosis was found. His paper, presented as a thesis for the degree of M.D. in the University of Dublin in 1883, consisted of a summary of autopsies obtained largely from the literature and in part from the General Hospital, Birmingham. Accordingly they represent in large part the same cases as were reported in other early articles. At this time Windle had examined only one case for the newly discovered tubercle bacillus and had failed to find it. In Windle's series two cases showed

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tubercles in the liver, one had tubercles in the spleen, five had tubercles in the kidneys and two had tubercular ulcerations of the intestine. So striking was the association in the minds of the physicians of the time that several writers believed there to be an hereditary tendency to the two. Thus, Croner⁴ relates the occurrence of an hereditary and familial tendency to tuberculosis in 37 out of 100 diabetics. Twelve others in this same series had tuberculosis. He quotes Schmidt who believed that there was a diabetic predisposition in tuberculous families. Purdy⁵ earlier had noted that the territories furnishing the highest mortality from diabetes in the United States coincided closely with those furnishing the highest mortality from consumption. One is forced to comment, however, that this would be true in the most thickly populated territories where also diagnostic facilities would be best. In Table 1 are summarized representative autopsy reports of active tuberculosis in diabetics and non-diabetics. Naunyn⁶ marked an epoch in the history of diabetes, which may also be used as the boundary between the old and the modern in tuberculosis study. Up to Naunyn, 1906, tuberculosis had been reported in 264 out of 622 diabetic autopsies or 42 per cent. In the 25,712 autopsies from 5 general hospital series including Klebs' report in 1909 active tuberculosis was found in 7955 cases, or 30.9 per cent.

These statistics of the frequency of tuberculosis in diabetes were largely based on autopsies performed upon patients under treatment in the large municipal hospitals in European cities. As suggested by Windle, doubt may legitimately be felt regarding the diagnosis in the cases studied before the discovery of the tubercle bacillus and before the general use of methods for its identification in the clinical study of cases. It should be remembered that in the latter part of the 19th century there was little segregation of tuberculous patients from non-tuberculous and that in those hospitals patients remained for long periods of time, and in the case of the poor, even to death.

Striking as these figures are, one should nevertheless compare them with statistics for the general population and particularly for the whole hospital population. The prevalence of tuberculosis was undoubtedly far greater than was suspected.

Klebs¹¹ in 1909 reviewed ten series of autopsies in children 0 to 15 years of age totalling 5308 cases. Of these, 1247, or 23.5 per cent were tuberculous. These series were published between the years 1889 and 1909. If deaths under one year were omitted, the percentage would be much higher. For example, the percentage would be 44 in Muller's series, 55 for

Hamburger and Sluka, and 40 for Sehlbach. A comparison of the percentage of tuberculous cases in diabetic autopsies with a non-diabetic series therefore may lead to gross errors unless all corrections for such factors as age, sex, changing diagnostic standards, and morbidity rates are applied by modern statistical methods.

The difficulties in drawing conclusions are illustrated by comparison with the association of tuberculosis and cancer. Pearl²⁷ found among autopsied cases of carcinoma at Johns Hopkins less than one-half as many cases with associated active tuberculosis as were found in series exactly comparable in number, age and sexes, but free from carcinoma. His inference that an antagonism exists between the two diseases had been disputed by Carlson and Bell¹⁵ who showed that a similar low incidence of tuberculosis occurs in cases with chronic heart disease. Figure 1 (reprinted from Carlson and Bell) presents the incidence of active (excluding healed) tuberculosis, cancer and heart disease in 11,195

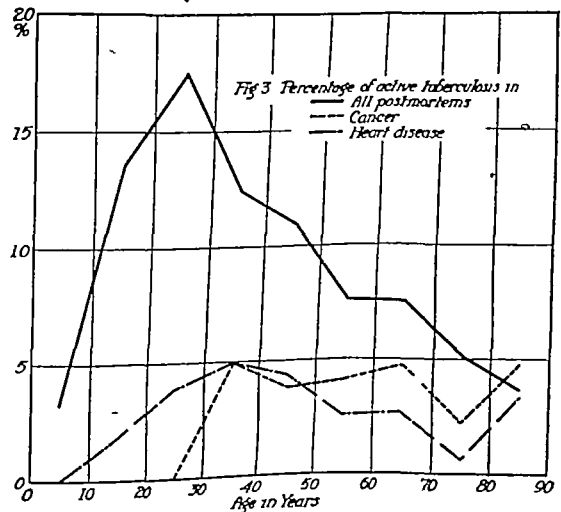


FIG. 1. Frequency of active tuberculosis at autopsy (Carlson and Bell)

postmortem protocols. Eleven thousand of the records were from the Department of Pathology of the University of Minnesota, and 195 from the Glen Lake Sanitarium for tuberculous patients near Minneapolis, Minnesota. Although the association of tuberculosis with heart disease is shown to be less than its association with cancer, a more important point for our discussion is emphasized, namely, that the frequency of the association of tuberculosis with either cancer or heart disease is much less than the incidence of tuberculosis in the group as a whole. This group is a heterogeneous one, including many patients who died of tuberculosis alone. This point is made more definite by Wilson and Maher¹⁴, who in computing the probabilities of an association of tuberculosis and cancer, estimated that in Pearl's series the association of the two diseases was really about three times as would be expected. Carlson and Bell

Morton in 1694 reported the first case of the combination. John Rollo in 1798 gave the clinical and postmortem records of a case of diabetes evidently complicated by pulmonary tuberculosis with cavity formation.

hold that patients usually die of a single major disease, aside from arteriosclerosis and terminal infections. The proper control for the association of active tuberculosis and any chronic disease is the incidence of active tuberculosis with some other chronic disease, with a similar age incidence, for example, heart disease. Cancer and heart disease, like diabetes are much less frequent than tuberculosis as causes of death in early life and the association of tuberculosis with these two may therefore be compared with the association of diabetes and tuberculosis. In figure 1 it is apparent that at no age period before 80 years is the association of these two diseases with tuberculosis on the average as much as one-half as frequent as is active tuberculosis in the series as a whole.

The large number of cases in Carlson and Bell's series justifies the conclusion that if the percentage of diabetic patients showing active tuberculosis is about the same as in the general population it is an abnormally frequent combination as compared with the combination of either heart disease or cancer with tuberculosis. Roughly it might be estimated under these conditions as being from two to three times as frequent as expected. Therefore, again referring to table 1, the fact that for the entire series the incidence of active tuberculosis at autopsy in the diabetics is 28.4 per cent and 22.9 per cent for the non-diabetic indicates a frequency of tuberculosis probably two to three times as great in the diabetic as would be expected.

The most important criticism of autopsy statistics depends upon the fact that the duration of diabetes is not given sufficient weight. The average duration of life after onset of diabetes was so short in the older series that no fair opportunity was afforded for the development of tuberculosis. This point comes out quite clearly in our study of tuberculosis in diabetic chil-

dren and will be alluded to later. In order to form an opinion as to the present incidence it is necessary to consider the changing morbidity and mortality rates for the two diseases as well as modern clinical and pathologic data.

b) TUBERCULOUS INFECTION AND MORBIDITY (INCIDENCE)

It is impossible to present with any accuracy the incidence of tuberculosis in terms of illness. Since the survey carried out by the Framingham Community Health and Tuberculosis Demonstration in Framingham, Massachusetts, disclosed nine active cases for every death it has become the custom to rate tuberculosis cases as being ten times the number of deaths in any community. The total number of persons ill with tuberculosis in the United States would therefore be estimated to be about 1,000,000. This estimate may be compared with Dublin and Joslin's estimate of approximately 250,000 to 400,000 individuals in the United States who have diabetes and about 2,000,000 who either have or will develop it.

The incidence of tuberculous infection is indicated by means of skin tests with reasonable accuracy. In addition autopsy reports have been carefully analyzed with regard to the evidences of latent or healed tuberculosis as well as active forms. Classic observations testify to the former universality of tuberculosis in European cities. The records of Naegeli⁸ (1900) showed that definite signs of tuberculosis were found in 97 per cent of bodies examined consecutively by him at Zurich, that is of persons dying in a general hospital from all sorts of diseases and accidents. Reinhardt¹³ found the remarkable fact that 32 per cent of his cases in Berne presented evidence of progressive lesions. Approximately one-third of all the patients who terminated their days from a variety

TABLE 1
INCIDENCE OF ACTIVE TUBERCULOSIS AT AUTOPSY

General					Diabetic Only				
Author	Period	No Cases	Tuberculous		Author	Period	No Cases	Tuberculous	
			No	Per cent				No	Per cent
Lubarsch ¹	1888	6536	2688	41	Griesinger ¹	1859	250	105	42.0
Naegeli ¹	1900	508	198	39	Frerichs ²	1884	55	21	38.2
Zahn ³	1902	6320	2058	33	Honl ¹⁷	1898	29	12	41.4
Norris ¹¹	1904	7040	1764	25	Williamson ¹⁸	1898	24	12	50.0
Klebs ¹⁴	1889-1909	5308	1247	23.5	Sauvage ¹⁹	1895	42	7	16.7
Steinmeier ¹⁵	1914	7231	1321	18.2	West ²⁰	1902	50	24	48.0
Reinhardt ¹²	1917	360	117	32.0	Seegen ²¹	1893	122	63	51.6
Suzue ¹⁶	1927	4207	890	21.1	Naunyn ⁶	1896	50	20	40.0
Carlson and Bell ¹⁷	1929	11195	960	9	Montgomery ²²	1892	25	6	24.0
Ophuls ¹⁴	1926	3000	682	22	Golden ²³	1908-1925	53	14	26
					Fitz and Murphy ²⁴	1924	37	7	19
Total		51705	11875	22.9	Warren ²⁵	1930	283	13	4.6
					Pagel and Henke ²⁶	1932	101	15	15
					Total		1121	319	28.4

Norris—Only cases showing tuberculosis of lungs, pleura, pericardium, heart and great vessels counted.
Klebs—Children 0 to 15 years.
Suzue—Cases over 20 years of age.

of ca at a large general hospital were the s of advancing tuberculosis, while, of the r 3, 64 per cent presented evidence of hea tuberculosis. More recently, and especially in American communities, long series of postmortem examinations have yielded less evidence of tuberculosis. Ophuls¹⁰ in San Francisco and Carlson and Bell¹⁵ in Minneapolis report much lower percentages. Thus Ophuls (p 170), comparing his series with 3 large autopsy series, found the incidence of healed or inactive tuberculosis to increase from 14 per cent in the second to 63 per cent in the seventh decade. Much depends upon the criteria adopted for the diagnosis. No very rigid comparison may be made with the incidence of healed tuberculosis at autopsy. The series of Carlson and Bell only shows 13.2 per cent in the eighth decade. Other evidences of decreasing infection in American communities appear in the examinations of school children in Framingham. The per cent of positive reactions to the tuberculin skin test in Massachusetts grade school children fell during 5 years from 28 to 17, according to Lord. On the other hand calcified tracheobronchial lymph nodes and areas of calcification in parenchymal tissue have occurred in approximately 75 per cent of chest roentgenograms of 1659 diabetic patients at the Deaconess Hospital. (See table 5)

4) FALLING MORTALITY RATES FOR TUBERCULOSIS

A striking fall in the death rate from tuberculosis in the total population has occurred during the last century. Pearson²⁸ and others consider that the decline in the death rate from tuberculosis indicates the subsidence of a world epidemic of tuberculosis due to an increase in racial immunity. However, it is true that other infections have similarly declined and it is unlikely that any racial immunity has been developed to all infections at the same time. The fall in death rate has varied widely in different communities in a manner more consistent with economic conditions and with efforts to control the disease than with any general increase in immunity. The death rate from tuberculosis (all forms) in the United States has fallen from 400 in 1866 to 69.1 in 1930 (47 states reported by U S Public Health Service²⁹). In 1930 the Massachusetts death rate for pulmonary tuberculosis was 56.9 and for other forms 7.3, the lowest on record. A decline in the death rate from tuberculosis has occurred in all parts of the civilized world. Had the 1866 death rates prevailed in 1928 in the United States, there would have occurred in the latter year 458,000 deaths. Instead the number of deaths was reduced by 80 per cent. If 300,000 lives were prolonged every year and one out of every 100 developed diabetes, the number of diabetics

would be increased by 3000. Although this may seem fantastic, no one would deny that the falling death rate from tuberculosis has contributed definitely to the increasing duration of life in this country. The control of acute infection and the reduction of infant mortality are equally important, but the fact is that the number of middle aged and aged individuals in the United States has greatly increased. (See table 2)

In 1930 the population (122,775,046) con-

TABLE 2
INCREASING AGE OF THE POPULATION
OF THE UNITED STATES

Age in years	1850 per cent	1900 per cent	1920 per cent	1930 per cent
Under 5 years	15.1	12.1	10.9	9.3
40-49	8.0	10.1	11.5	12.2
50-59	4.8	6.8	7.9	8.7
60-69	2.6	4.1	4.8	5.1
70-79	1.1	1.9	2.1	2.5

tained approximately 1,700,000 more individuals between 70 and 79 years of age than would have been the case if the percentage of 18 still was maintained. Indeed 17.2 per cent of the population were over 50 years of age in contrast to 8.9 per cent in 1850. Dublin³¹ states that the number of aged persons increased 60 per cent while the total population increased only 39 per cent between 1900 and 1920. New York City the percentage of the population 65 years of age and over increased by 3 per cent between 1900 and 1930. The most frequent age of onset of diabetes is 51 years. It is noteworthy that in New York City according to Drolet and Dorr³² the peak of the death rate from tuberculosis for males has moved forward from the age group 40-44 in 1901 to the group 55-60 in 1930. The peak of the death rate for females still remains in the age group 20-24 years.

The rate of progress toward control of tuberculosis continues and naturally tends to reduce the number of contacts for the diabetic. Un-

TABLE 3
DEATHS FROM PULMONARY TUBERCULOSIS COMPARED
WITH TOTAL DEATHS IN 2650 FATAL CASES OF DIABETES

	Total Deaths	Deaths from Pulmonary Tuberculosis	
		Num ber	Per Cent of Total
1898 June 1914	342	16	4.7
1914 Aug 7, 1922	805	46	5.7
1922 Nov 2, 1931	1503	99	6.6

NOTE The above statistics are based upon statistics first seen between 1898 and Jan 1, 1922, up to and including Case No 7564. All deaths reported in the series up to Nov 2 1931 are included.

diabetes in some way specifically increases liability to the development of tuberculosis.

insure to active cases in the community and reduce the incidence of pulmonary tuberculosis. If, however, prolongation of life, by modern treatment means, is due to the diabetic tendency to prolongment of tuberculosis to act then the death rate will decrease and may actually diminish. That the latter is the case is shown in table 4 showing the rising mortality from tuberculosis.

TABLE 4

DIABETIC MORTALITY IN THE REGISTRATION AREA OF THE UNITED STATES

Population in Registration Area, Per Cent	Deaths from All Causes Rate per 1,000 Population	Deaths from Diabetes Num ber	Rate per 100,000 Population
17.0	19.8	237	2.8
31.4	19.6	1089	5.5
37.9	17.8	2693	9.3
58.3	15.0	8040	14.9
82.2	13.1	14062	16.1
	11.8	17385	16.9
96.2	11.3	22528	19.0
96.3	11.1	24331	20.4
			22.0

important to remember differences in the death of the two diseases. The peak of tuberculosis death rate was formerly reached in adult life long before the peak of the death rate. Even in 1932 among policyholders of the Metropolitan Life Insurance Company the average age at death from tuberculosis was 39.8 years whereas the average age at death from diabetes was 61.2 (personal communication from Mr. Herbert Marks). The fall in the death rate from tuberculosis after the age of 40 parallels the percentages of the population in these age groups. In the United States report for 1928 out of 80,285 deaths from primary tuberculosis 81 per cent (65,485) occurred before the age of 45 years. In contrast to this age distribution one must remember that 90 per cent of all diabetes begins after the age of 40 years and that 51 years is the frequent age of onset, a period of life never reached by the majority of patients with serious tuberculosis.

This difference in age incidence has been recently stressed in comparisons of the incidence of diabetes in the tuberculous with the incidence of tuberculosis in diabetics, but is shown in Bolduan's³³ analysis of statistics for New York City in table 6.

INCREASING DIABETIC MORTALITY RATE

Incident with the falling death rate from tuberculosis, the death rate from diabetes has gone through a most extraordinary increase. In fact there is no other disease about which we have reliable statistics which has made such a

striking increase in the United States. In table 5 are shown the total and diabetic mortality in the Registration Area of the United States, according to Joslin, Dublin and Marks.³⁴

Similar increases in mortality are shown by Life Insurance, State and City statistics, especially in the larger cities. Indeed, it is noted that the greatest increases are shown in communities where medical and diagnostic facilities are most modern and consistent with the belief that part of the increase is due to more frequent urinalyses, periodic health examinations and insurance examinations. The increasing duration of life allowing hereditary tendencies to become manifest is clearly a most important factor. Possibly the urbanization of the population with less manual labor is an important factor. The community contains relatively more diabetic individuals now than the mortality rates indicate since with modern treatment the duration of life has been so greatly increased. The ages at death of diabetes have changed accordingly. In 1890 the diabetic death rate per 100,000 in the Registration Area of the United States for 45 years and over was 20.6 whereas in 1920 it was 57.3. The change in ages at death of diabetes is better shown by the rates for Massachusetts cited by Joslin. Since 1922 the mortality for those under 50 years has been cut in half and for those over 50 years of age has been doubled. From 1921 to 1925 86 per cent of all diabetic deaths in Massachusetts took place at or above the age of 50 years.³⁵

In Toronto also, whereas in 1918 to 1920 the percentages of deaths from diabetes occurring above and below the ages of 50 years were about equal, since that period a steady advance in age at death has occurred until in 1931, nearly 90 per cent of the diabetic deaths occurred over the age of 50 years (Joslin et al.³⁶). The greater longevity of the diabetic increases the opportunity for infection.

A great increase in the number of diabetic deaths in females has occurred. In summary, five facts of fundamental importance have come out: 1) The former almost universal infection of the community with tuberculosis beginning at an early age is diminishing. 2) The prolongation of life of the tuberculous patient is shown by the falling death rate and delay in the peak of the death rate. 3) The great increase in the number of diabetics in the community is due in part to better diagnoses, better treatment and the increased longevity of the population as a whole bringing more people into the diabetic age period. 4) The average duration of life of the diabetic is steadily increasing with consequent increased opportunity for the development of tuberculosis, if exposure to open cases occurs, or if diabetes exerts a specific influence in its development. 5) The mortality from tuberculosis among diabetics has in-

creased in spite of the general reduction in tuberculosis mortality

6) PRESENT-DAY EPIDEMIOLOGY OF ASSOCIATED DIABETES AND TUBERCULOSIS

a) *Childhood* The development of pulmonary tuberculosis in school children has been thoroughly studied so that comparison of its frequency in diabetic children is more reliable than ever before. White³⁷ estimates the total number of diabetic or pre-diabetic children in the United States as 25,000, basing her analysis on the fact that in 1922, the number of diabetic deaths in childhood was 1,080. This represented 1 in 8000 children in the population. Since the duration of life then was only about one year, the number of deaths would represent the number of new cases per year. Assuming that since the use of insulin no deaths occurred, there should be approximately 10,000 cases, and with an allowance of 1,000 per year for the fifteen years of childhood, a total of 25,000 cases might be credited to diabetic or potentially diabetic children. The frequency of diabetes in childhood is better pictured if we realize that there are as many children who have the disease before they are ten as there are men and women who develop it after they are seventy.

In considering the incidence of tuberculosis in diabetic children, the duration of diabetes is of prime importance. Without observation through the period of adolescence no adequate idea of the probable effect of diabetes upon the development of tuberculosis will be obtained. The series of chest roentgenograms upon 280 children included in table 5 disclosed only one case of chronic pulmonary tuberculosis and one early acute case. These children and adolescents were not acutely ill and the series is not therefore comparable with a general hospital series in which patients would be included who had been sent to the hospital because of illness. However, within three years, repetition of x-rays showed three more of these patients to have developed adult pulmonary tuberculosis.

The evidence of postmortem examination is of doubtful value for the same reason, namely, that few autopsies have been performed upon children with diabetes of prolonged duration. Tuberculosis was not found in 13 autopsies performed upon children with onset of diabetes in infancy (White³⁷, page 208). In three cases the duration of diabetes was between 11 and 21 years, in seven the duration was 0.3 years or less, and the duration in the remaining three was unknown.

Warren³⁸ reports twenty-two autopsies upon diabetic children without pulmonary tuberculosis. Later at the Deaconess Hospital one death from extensive pulmonary tuberculosis occurred in a boy, Case No. 7041, who died at the age of fourteen years after diabetes of eight years' duration. Only two other cases among his twenty-four (2 cases added since publication of the

22 mentioned) had a duration of years. In the older literature hood were not rare. Naunton, Pagel and Henke³⁹ (see Chap. 12, *Med.*, Jan 11, 1934) had only one tuberculosis in thirteen diabetic children in the first decade.

The incidence of infection as Mantoux test and the x-ray evidence of pale tracheobronchial glands is comparable in frequency with the results of studies carried in Massachusetts school children by the Department of Health. Chadwick and Zerk report a study based on 42,071 children from 1 to 15 years of age examined physically given the Pirquet tuberculin test during a period of three years. The ratio of reactions at age five, and 28 per cent at age ten, 35 per cent at age fifteen. In 1929-1930 at 7,318 high school students tested in these children 39 per cent reacted, according to Pope, quoted by Lord⁴⁰. The average percentage for an entire group of 275,252 children including school year 1930-1932 is 25, according to L. Hetherington, Opie and their associates⁴¹. They found that by age the ratio of reactors consistently from about 15 per cent at five to 50 per cent at the end of high school, and 0.01 mgm of old tuberculin intracutaneous. Different sections in the city may show a variation in the percentage of reactors. It was found in one city of 60,000 that the number of children reacting to the tuberculin test in different school districts varied from 11 to 39 per cent. The number of reactors increases with the opportunities that the child has for contact with bacillus carriers. Persons with chronic forms of pulmonary tuberculosis, such as found in granite quarry workers, expose and infect more children than persons with acute forms, who live a much shorter time before the disease becomes infectious. Crowded living conditions afford more opportunities for contact and congested areas show a higher percentage of infection. Twice as many reactors were found among children with a history of direct contact with a case of pulmonary tuberculosis. Another factor to be taken into account is vine infection. In a few rural towns with a scattered population and less than the average number of pulmonary tuberculosis deaths, 38 per cent of reactors were found. The majority of the small towns, however, show a little less than the average percentage for the state as a whole. The boys of the Irish, Canadian and Tent groups in this series show a much higher incidence of infection than the girls. The death rate in Massachusetts for all forms of tuberculosis declined from 144 per hundred thousand in 1917 to 73 in 1927.

The scarification method rather than Mantoux test was used in the Massachusetts

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1 Although the percentage of reactions Doubtful or negative somewhat reduced according to Table 8 (Chap III, *New Eng J Med* 1934) these cases are listed by age. It is apparent that most of them are in the older age groups so that the incidence is comparable with Chadwick data. It should be noted however that the Chadwick data were based on the notification method of von Pirquet which gives a somewhat fewer positive reactions than the intradermal method of Mantoux. Our children lived in nearly all cases 0.1 cc of 1:1000 dilution of old tuberculin. In certain cases failing to react with this dose 0.1 cc of dilutions of 1:100 or 1:1000 were used. Naturally a higher percentage of reactions are obtained if multiple tests are used, as illustrated by the results of "little" who obtained 75 per cent reactions with intracutaneous tests carried to 1 mg as compared with 37 per cent by the scarification method alone. When these facts are considered, one might conclude that the apparently greater incidence of infection among diabetic children far tested may be more apparent than real, especially as the small number tested does not allow a fair comparison. However a consideration of the roentgenologic and clinical data confirms this greater incidence of tuberculosis.

The great frequency of tuberculous infection in diabetes during childhood and adolescence appears in a consecutive series of roentgenograms of the chest carried out by Dr L. B. Harrison and Dr I. K. Bogan, and summarized in Table 5. These patients had been admitted to Deaconess Hospital for treatment of diabetes and for the teaching of parents. They were not acutely ill. The classification "tracheobronchial adenitis" included visible and chiefly enlarged glands at the hilum. The group in which definite calcification of tracheobronchial glands occurred is the largest and may be assumed to represent healed or partially healed tuberculous infection. Thus, 42 per cent of the cases in the first decade and 70 per cent in the second decade presented this finding. Suspect cases showed slight increase in markings usually toward the apex. From this group have come four cases of pulmonary tuberculosis within three years. In summary it appears that tuberculous infection in diabetic children is definitely of greater frequency than among school children of Massachusetts, Philadelphia or San Francisco.

b) *Clinical tuberculosis in childhood diabetes* Among 750 diabetics with onset of the disease before fifteen years of age twelve have subsequently developed pulmonary tuberculosis of the

adult type. In eight cases there was a definite history of contact with tuberculous cases. Six were girls and six boys. In addition tuberculosis of the skin has occurred twice, tuberculous peritonitis once and broken down cervical adenitis once.

In only three of the twelve cases did tuberculosis develop before the age of fifteen years; in the remainder tuberculosis was not recognized for periods of 2.5 to 80 years after onset of diabetes. Consequently the rate of incidence must be compared not with the incidence at first examination of school children but with incidence after a follow-up of three years. Fortunately data from the Chadwick clinics are available for Massachusetts. Pope's reports on the results of a follow-up of 5000 school children from two to six years after they were classified as having pulmonary tuberculosis, childhood tuberculosis or as suspects. Thirty new cases of pulmonary tuberculosis developed in this group, nine in boys and 21 in girls. The average age of diagnosis was 15.4 years as compared with 16.7 years for our twelve diabetics. The proportion of cases developed in the childhood type group (with visible or calcified tracheobronchial glands) was twice as high as among the suspect group.

In this observation group of 5000 cases then, pulmonary tuberculosis developed in 0.6 per cent. The incidence of pulmonary disease in the total school population was 0.1 per cent. From the total number of children, 140,000, it is possible, by adding the number who had pulmonary tuberculosis at first examination and the number who developed it during observation from two to six years afterward, to obtain an estimate with which to compare the diabetic incidence. The incidence in the school population so obtained is 0.12 per cent. The incidence among the 750 diabetic children is 1.6 per cent.

An incidence 13 times that of normal school children is surprising and possibly would not hold in a larger group of diabetics. The proportion is not so outstanding if comparison is made with the results obtained by Hetherington, McPhedran and associates¹² in a study of 4000 school children in Philadelphia. They had 22 cases of pulmonary tuberculosis, or an incidence of approximately 0.5 per cent. Possibly the greater number of colored children in Philadelphia may have influenced their results.

If the adolescent group with onset of diabetes from 15.1 to 19.9 years are studied, the development of tuberculosis is still conspicuously high. From 1898 to 1931, 251 such patients are to be found in Joslin's series. Of this number four have died and four are alive with pulmonary tuberculosis, an incidence of 3.2 per cent. In Massachusetts among 7318 high school children evidence of pulmonary tuberculosis was demonstrated in but 13, an incidence of 0.2 per cent. The incidence of pulmonary tuberculosis is probably underestimated in the diabetic series.

Although our rate of incidence is computed on the entire group of 750 children and 251 adolescents, only a fraction of this group were subjected either to skin test or to chest x-ray. Had the entire group been as completely tested as the school children, undoubtedly other cases would have been discovered. When one recalls that, according to the autopsy data of Carlson and Bell, the combination of tuberculosis with diabetes should be much less frequent than its incidence in a heterogeneous group, the frequency of tuberculosis in the juvenile diabetic becomes relatively far greater.

c) *Adults* (1) *Autopsy Statistics* The frequency of active tuberculosis as found at autopsy varies in different communities and also, with diagnostic standards of the time and of the individual pathologist. Probably there would be little disagreement with regard to the finding of active pulmonary tuberculosis. Apparently tuberculous infection is somewhat less frequent in American general hospitals than in European, as is well-shown in Ophuls' analysis of 3000 autopsies performed in San Francisco in the Hospital of Stanford University. In table 1 only active tuberculosis is included and for present discussion a comparison of statistics should be limited to the period since 1920. In the series of Suzue, Ophuls and Carlson and Bell a total of 18,402 autopsies showed active tuberculosis in 2482, an incidence of 13 per cent. The four diabetic series of Golden, Fitz and Murphy, Warren, and Pagel and Henke yield 49 cases of active tuberculosis in 474 autopsies, or only 10 per cent. As Carlson and Bell have shown, such an incidence of tuberculosis with diabetes is at least twice as great as the incidence of tuberculosis occurring in association with such chronic diseases as cancer or heart disease.

Certain criticisms may be levelled at any comparison of autopsies, and upon analysis it will appear that the comparison made above probably errs on the side of minimizing the frequency of tuberculosis in diabetes. First, the large general hospital series include relatively many more children than the diabetic series. Thus, in the non-diabetic series of Carlson and Bell, 25 per cent of the total were less than ten years of age, whereas in Warren's diabetic series only 3 per cent fell in this age period. Over 15 per cent of all cases of tuberculosis in the Carlson and Bell series occurred in cases under twenty years of age. In Ophuls' series 9 per cent of all active cases of tuberculosis occurred under the age of ten years and 12 per cent of the 3000 cases autopsied were under twenty years of age. The high incidence of tuberculosis as a cause of death in young children overloads general hospital statistics in comparison with a diabetic series.

Secondly, the factor of prolonged duration

of diabetes is not properly presented in the autopsy series. Among the 245 clinical series, 49 had had diabetes more than ten years. The average duration of diabetes in tuberculous cases at the Deaconess Hospital was nine years. Warren⁴⁰ collected 17 autopsied cases of diabetes with duration of ten years or more to which I add two with active pulmonary tuberculosis, making 19. In 1257 with healed apical lesions. The average duration therefore in the small group is 8 per cent. In table 1 (Chap II, *New Eng J Med*, 1934) the average duration of twenty years at autopsy was but 2.5 years and in exceptional cases the age at death is given in years as the onset of diabetes. No data are available as to duration in the others, but with most autopsy series upon diabetics have occurred from coma or sepsis so that death occurs within one to three years after onset in

TABLE 5
SUMMARY OF 1659 X RAYS OF DIABETIC

1	No abnormality
2	Tracheobronchial adenitis
3	Calcification in tracheobronchial glands
4	Doubtful or border-line pulmonary tuberculosis
5	Chronic pulmonary tuberculosis
6	Acute pulmonary tuberculosis
7	Old healed tuberculosis

NOTE The 21 cases of old healed tuberculosis included in group 3 because all had calcified bronchial glands.

that no fair presentation is afforded of the incidence of tuberculosis under conditions of an adequate period of exposure to diabetes.

Thirdly, autopsy series in the past have reflected the changing social and economic conditions of the diabetic. Not only does he live longer but because of the beneficial effects of insulin upon his general condition, he lives in a life of semi-invalidism and isolation, not going to work with the general population. Community means more frequent contact with open cases of tuberculosis, and more frequent infections.

(2) *Clinical* The incidence of tuberculosis in diabetics has been studied at the New England Deaconess Hospital by making x-ray examinations of the lungs of 16 diabetics consecutively, in addition to the usual examinations. The results have been summarized according to the x-ray findings and are given in table 5. Classification of the roentgen findings was made as follows:

1	No abnormality
2	Tracheobronchial adenitis without calcification
3	Tracheobronchial adenitis with calcification

subtful Slight increase in markings without pulmonary infiltration
 chronic pulmonary tuberculosis
 acute pulmonary tuberculosis Areas of soft hazv infiltration without scarring or calcification
 healed pulmonary tuberculosis Only cases with well marked fibrous scarring and calcification are included Less definite and border line cases have been classified under heading 3, since they always had calcified glands as well

In this series forty cases of pulmonary tuberculosis were found, two in childhood and thirty-eight among 1373 adults, or an incidence of 2.8 per cent for adults

Again it should be noted that this group of 40 cases consisted of patients admitted to the hospital for dietary treatment and instruction, not for incapacitating or febrile disease. They were not bed patients, with few exceptions. Therefore these results should be compared with results of community surveys, Draft Board examinations rather than with series of examinations of patients admitted to general hospitals because of symptoms requiring study or treatment. These considerations may have some bearing on the fact that Sosman⁴⁷ reported seventeen cases, an incidence of 9 per cent, active pulmonary tuberculosis in a series of 182 consecutive routine chest films in diabetics from the Peter Bent Brigham Hospital. The usual estimate at present is that one per cent of the population has active tuberculosis. For diabetics therefore had active pulmonary tuberculosis almost three times as often.

(3) Vital Statistics The statistical evidence of the association may be obtained from clinical studies or from public offices of health. The series here reported of 245 cases from 10,000 cases of diabetes in the series of Dr. E. P. Joslin indicated an incidence of less than 2.5 per cent. The total number of deaths from all causes from 1895 to November 2, 1931 was 2650, of whom 161 representing 6.0 per cent, died of tuberculosis, either pulmonary or military. Labbé reports 10 per cent of diabetics in Paris in private practice with tuberculosis in contrast to 20 per cent in public hospitals. During 1930, among 450 diabetics treated at the Hôpital de la Pitié, Labbé⁴⁸ reported that among 243 deaths 24.3 per cent were due to pulmonary tuberculosis. Fitz⁴⁹ analyzed 1529 diabetic cases admitted to the Peter Bent Brigham Hospital from October 1, 1922 until January 1, 1929 and found 35 who had pulmonary tuberculosis. He estimated that there were 16,000 diabetics with pulmonary tuberculosis in the United States.

Kuelz⁵⁰ found pulmonary tuberculosis in only 1 per cent of 692 diabetics. Curschmann⁵¹ found tuberculosis in 4 per cent of his diabetics. Also did Rosenberg and Wolf⁵² in 1000 cases from Berlin. Delhanniss and Petassis⁵³, in describing 70 cases in Vienna, state that between

1925 and 1931 seven per cent of all diabetic admissions to the hospital had or developed pulmonary tuberculosis. John⁵⁴ reported that tuberculosis caused 9.1 per cent of 131 deaths in his 2000 cases. Lyon⁵⁵ reported from England in 1930 among 150 diabetic deaths only 11 or 7.3 per cent due to tuberculosis. Murphy and Moxon⁵⁶ whose 827 cases of diabetes were chiefly from the rural population of Wisconsin found only 40 cases of tuberculosis, an incidence of 4.8 per cent. Sevringhaus⁵⁷ had only eight cases of tuberculosis in 500 diabetics chiefly from the urban population of Wisconsin. Wendt and Peck⁵⁸ reported 43 cases among 1073 diabetics in and about Detroit, Michigan. Kramer and Lawson⁵⁹ studied the roentgenograms of 408 diabetics in Providence, R. I., and found but five cases, an incidence of 1.2 per cent. The value of such statistics depends upon the duration of the diabetes in the patients as well as the sex, severity of diabetes and frequency of coma. Later examination of this group will be of great interest. Nearly all series of diabetics studied clinically demonstrate an incidence of pulmonary tuberculosis far in excess of the 1 per cent usually accepted for the general population of the United States.

The infrequency of diabetes in tuberculosis sanatoria has been emphasized. Tompkins⁶⁰ reported only fourteen diabetics among 4,500 admissions with tuberculosis to the United States Veterans' Hospital at Oteen. Wassmud⁶¹ in 8000 sanatorium cases of tuberculosis in Germany found 60 diabetics. Leitner⁶² described in 1930 twelve cases of diabetes among 3500 tuberculous patients in a sanatorium at Bad Reiboldsgrun.

Banvair⁶³ cites the following statistics. Among 5,224 tuberculous patients admitted to the Muirdale sanatorium since January 1, 1923, there were 31, or 0.59 per cent, who were found to be diabetic. In 1929, Landis, Funk and Montgomery⁶⁴, on the basis of 31,834 sanatorium cases treated for pulmonary tuberculosis in 29 sanatoria assumed that the coexistence of these two diseases was between one-sixth and one-third of one per cent. Wassmud in 1927 found diabetes in 60 out of 8,000 tuberculous patients. This amounts to 0.75 per cent.

So far as the incidence of pulmonary tuberculosis in diabetics is concerned, Banvair⁶³ gives statistics from the recent American literature. In a group of 8,520 diabetics the incidence of pulmonary tuberculosis was approximately 2.6 per cent. His calculations would indicate that tuberculosis occurs about three times more frequently in diabetics than diabetes occurs in the tuberculous. Such a comparison has little meaning unless the ages of the groups are considered. Tuberculous cases in sanatoria are often young. One might as well compare the frequency of diabetes in cases of poliomyelitis.

This is strikingly suggested by the fact that

in 1931 at the Trudeau⁵⁵ Sanatorium out of 284 patients listed, only 19 were between 40 and 49 years of age and but one was over 60. There were 169 cases between 20 and 29 years of age. Such a predominance of youth would not necessarily be found in State Hospitals where a selection of young and early cases could not be made. However, a large proportion of the cases with the most serious tuberculosis die before reaching the age when the liability to diabetes becomes greatest. Statistics from tuberculosis sanatoria in the future will probably demonstrate a higher frequency of diabetics. At present there are more diabetics in tuberculous sanatoria who have been referred after treatment for diabetes at the Deaconess Hospital than ever before.

The errors in interpretation which may arise from a disregard of the differing ages at death of tuberculous and diabetic patients are well illustrated by a study of the mortality statistics for New York City by Bolduan in the Weekly Bulletin of the Department of Health⁵⁶. In 1931, among a total of 77,418 deaths, 1,921 were charged to diabetes, making diabetes in a general way responsible for a mortality of 2.4 per cent. However, among 4370 deaths from pulmonary tuberculosis recorded in New York City in the same year only 67 had diabetes entered as a contributory cause or 1.5 per cent. Diabetes thus appears less frequently than would be expected. A similar result is obtained in Massachusetts. Dr. A. S. Pope has informed me that the diabetic deaths form 1.7 per cent of all deaths in the State for the year 1930. Yet among the 19,763 deaths from tuberculosis between 1924 and 1929, diabetes occurred in only 0.9 per cent. In table 6 are shown the rela-

tuberculosis must be studied in the age group over 45 years where diabetes is most common. Bolduan has analyzed the tuberculosis register of New York City, containing 18,208 cases. He finds 3239 males and 964 females over 45 years of age. According to the census enumeration, the population of the group over 45 years of age in 1930 was males 732,128, females, 732,049. The incidence of tuberculosis in the two groups was expressed as rates of 4.4 per 1000 males and 1.3 per 1000 females. The average number of deaths of diabetics in persons 45 years of age and over during the two years 1930 and 1931 was males 584, females, 1170. On the basis of the tuberculosis incidence just calculated we might expect 2.5 cases of pulmonary tuberculosis among the 584 males and 1.5 cases among the 1170 females. As a matter of fact, however, the average incidence of pulmonary tuberculosis among the diabetes deaths, in persons 45 years and over during the two years 1930 and 1931, was among males 18.5 and females 23.

Bolduan points out that the registry of pulmonary tuberculosis includes only names of patients whose address is known. Some patients reported cannot be found. The register is not complete. However, there is no reason to believe that the number of actual cases is twice the number in the registry. Even if the calculations were made on the assumption that the register was only 50 per cent accurate, the incidence of tuberculosis in the diabetics over 45 years of age would be 18.5 cases among males, calculated 5, and 23 cases among females, calculated 3.

(d) *Other epidemiologic factors*. For tuberculosis in general in civilized countries no factors are more clearly brought out than the effects of wages, housing, food, occupation and

TABLE 6
MORTALITY FROM DIABETES AND PULMONARY TUBERCULOSIS IN NEW YORK CITY

Year	Deaths from Diabetes before the age of 45 years				Deaths from Pulmonary Tuberculosis after the age of 50 years			
	Male		Female		Male		Female	
	No	Per Cent of Total	No	Per Cent of Total	No	Per Cent of Total	No	Per Cent of Total
1930	62	10.9	77	6.6	841	26.8	283	15.0

tive proportions of total deaths from diabetes and tuberculosis in different periods of life.

When more than 90 per cent of the diabetic deaths occur after the age of 45 years, it is apparent that the above rate of 1.5 per cent for the occurrence of diabetes as a complication of tuberculosis means that tuberculosis does not encourage the development of diabetes. In general patients with pulmonary tuberculosis who die before the age of 45 years do not develop any more diabetes than the general population. This confirms the older idea that the association of tuberculosis and diabetes is one-sided, i.e., diabetics tend to develop tuberculosis, but tuberculous patients seldom develop diabetes.

The effect of diabetes upon the incidence of

habits. Strikingly low mortality rates are reported in rural states as compared with an industrial and commercial state like Massachusetts. All our 245 cases were from New England, although different racial stocks, occupations, and social habits naturally occurred. City and town dwellers formed 66 per cent. Poverty was a possible factor in only 10 per cent. Alcohol can hardly be discussed. Although in 76 cases there was a record of the use of alcohol, we do not have reliable data as to amounts. Certainly few stigmata of alcoholism were noted. An analysis of racial stocks does not give much help. One hundred and sixty-three were recorded as American, 22 as Hebrews, 12 as Irish, 12 as Canadian and 7 as Italian. Other Eu-

ropean nationalities were represented by but a single case

(1) Contact with active cases A history of familial tuberculosis or contact in the daily occupation was obtained in 65 cases, with 40 others in which rather indefinite contact may have occurred Unfortunately we have no accurate data as to the frequency of positive sputum cases among the persons to whom our cases were exposed Nor can we in most cases form an opinion as to the length of exposure As a whole the group does not appear to have had unusually close contact with active cases

(2) Occupation An indoor or sedentary occupation was recorded in 194 cases or 79 per cent, as compared with 74 per cent in Fitz' series The occupations with exposure to hard metal or rock dust are notably most dangerous Farming is the most favorable occupation so far as the development of tuberculosis is concerned However, diabetes has no tendency toward the selection of persons occupied in any one trade and in the analyses of 245 cases in this series so great a variety of occupations is found that no single group is very large although sedentary and indoor occupations appear to predominate Certain cases stand out as for example, two Jewish butchers who had long been engaged in an occupation where they might have been frequently exposed to tuberculosis while slaughtering animals Case No 10548 was a granite cutter and had silicosis moderately far advanced In Naunyn's 17 adult cases, the occupations were tailor 4 shoemaker 2, office-worker or merchant 3, weaver 1, waiter 1, hair-dresser 1, designer 1, laborer 2, mason 1, machinist 1

The danger of infection during the professional training of nurses and physicians has been repeatedly stressed Opie⁶⁶ and associates have reported the increasing incidence of grave tuberculous pulmonary lesions in medical students with each year of the course Myers⁶⁷ emphasizes the increase in the number of positive tuberculin tests among the probationers in schools of nursing after they have taken tuberculosis services Cooper⁶⁸ finds that the percentage of officers in the medical and dental corps of the United States regular army suffering from tuberculosis is much higher than among other corps Three out of 50 deaths among diabetic doctors have been due to pulmonary tuberculosis Two out of five diabetic girls who undertook nurse's training have developed pulmonary tuberculosis and are now in sanatoria Two other diabetic graduate nurses are known to have tuberculosis

(3) Age and sex Age and sex factors are unusual in that almost no deaths from tuberculosis occur in diabetic children In the past, diabetic children have died too soon for the development of tuberculosis Among 162 fatal cases of this series no death occurred in the first decade and

two in the second In these two decades about 10 per cent of all cases of diabetes have their onset Only 27 per cent of the 162 deaths occurred under 40 years The peak of the mortality curve is in the sixth decade for males and in the seventh decade for females The usual predominance of the female rate over the male from the tenth to the twenty-fifth year is not shown in the diabetic group The total number of male deaths is 119, and female 43 The sex distribution for diabetes is about even so that the sex difference in cases developing tuberculosis requires explanation Possibly the fact that women with diabetes have not in the past undergone pregnancy may be important Further diabetic women have been less likely to continue at industrial employment than diabetic men

Tuberculosis is emphasized as the menace of youth and especially of the period from 20 to 40 years In later years of life tuberculosis may be even more serious in its effects so far as the transmission of the disease to other persons is concerned Cornet⁶⁹ stressed the fact that tuberculosis is really a greater danger in old age than in youth if one takes into account the relative number of persons living in the different age levels

So in diabetes the bulk of active pulmonary tuberculosis occurs late in life partly because 60 per cent of diabetic cases begin after the age of 40, and partly because tuberculosis latent in early adult life becomes more active at that period either through reinfections or because of the debilitating effect of the diabetes Among the 245 cases are found 49 cases of pulmonary tuberculosis developing in diabetics after the age of 60 years Rubin⁷⁰ also in analyzing 414 cases of pulmonary tuberculosis past 50 years of age, found that 72 (17 per cent) were diabetics One must consider loss of resistance due to advancing years as well as due to the development of diabetes Climate and altitude have not been shown to have any unusual influence in diabetic tuberculosis In so far as a cold wet climate prevents outdoor life it may have an influence in treatment

(4) Social and economic factors Poverty with consequent crowding either in the city or country but chiefly in urban populations has always been a prominent factor Labbé states that whereas in public hospital wards 20 per cent of diabetic patients are tuberculous, among his private patients the incidence was less than 10 per cent

Diabetic patients as a group do not belong predominantly to any one social group The effect of poverty and crowding are demonstrable in selected groups, but there is probably no more diabetes among poor people than among wealthy

(5) Race There can be no doubt that certain races do have a lower mortality rate for

tuberculosis than others Up to July, 1926, Joslin reported only four Jewish deaths from tuberculosis among 143 fatal cases of diabetes in Jews In the series of 245 cases, 22 were Jews or 9 per cent, whereas Jews formed 13 per cent of 4262 diabetics in Joslin's series All standards have agreed that the Italian and Hebrew races have rather low tuberculosis mortality, whereas the Negro mortality rate in the United States is more than three times greater than that of the white race, and in urban populations is as much as four times higher However, local conditions affect these racial rates enormously Dublin⁷¹ has pointed out that the Hebrew rate is lower in the Bronx than it is in congested portions of lower New York City So with the Negro rate which is much higher in the city than in the country Opie⁷² has studied the epidemiology of tuberculosis among Negroes In 1926 the mortality rates in the United States Registration Area for Negroes was 233.2 per cent in the general population, 300.6 per cent in the urban, and 197.4 per cent in the rural population. He questions whether this great incidence is due to (1) inherited susceptibility, (2) the effect of social and environmental condition, or (3) a peculiar susceptibility in adult life because of their failure to develop tuberculosis and some degree of immunity in childhood. Tuberculosis in the Negro is of interest in this country because until recently diabetes was supposedly rare in the Negro race However, Leopold⁷³ reported the mortality rate of Negroes from diabetes in Baltimore to be slightly higher than among the white population

SUMMARY

1) The incidence of active tuberculosis in 1121 diabetic autopsies was 28.4 per cent and in 51,705 non-diabetic autopsies 22.9 per cent Since the association of the two diseases would be expected less than half as frequently as the incidence of tuberculosis alone, it follows that active tuberculosis occurred in diabetics at autopsy between two and three times as frequently as expected

2) Tuberculous infection in diabetic children as shown by skin tests and calcified tracheo-bronchial glands is more common than in Massachusetts school children and the development of adult type pulmonary tuberculosis in a group of 750 children who developed diabetes before the age of 15 years, was more than 13 times as frequent as among Massachusetts school children

3) Among adolescent diabetics, who developed the disease between the ages of 15.1 and 19.9 years, pulmonary tuberculosis occurred 16 times as frequently as among Massachusetts high school students

4) Among 1373 diabetic adults, consecutively examined by x-ray, active pulmonary tuberculosis was found in 38 cases, or 2.8 per cent

5) Deaths from pulmonary tuberculosis among diabetics increased from 4.7 per cent of 342 deaths before June, 1919 to 6.7 per cent of 1503 deaths between August 7, 1922 and November 2, 1931 in spite of the decreasing tuberculosis mortality in the community

6) The factors of familial contact, race, occupation, housing, poverty, and alcoholism do not appear to explain the greatly increased incidence of pulmonary tuberculosis in diabetes

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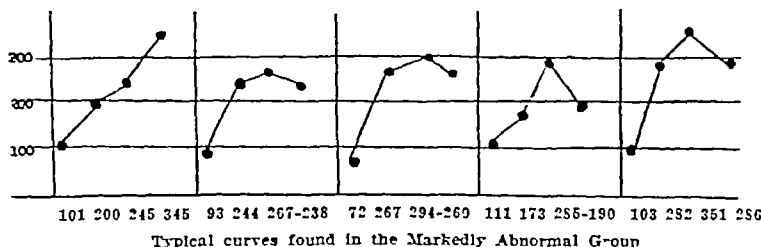
SUGAR TOLERANCE IN THE ARTHRITIC*

BY H. ARCHIBALD NISSEN, M.D.,† AND K. A. SPENCER‡

THE problem of arthritis seems to the authors to be this: Why do patients develop joint and general body tissue changes, which in one group progress steadily to marked and final dis-

determine what prognostic value may be obtained from successive, or single, sugar tolerance tests

The results of the tests were divided into four



Typical curves found in the Markedly Abnormal Group

ability, and in another group fail to show the same destruction and disability? The first group is recognized by those men interested in arthritis as the group which has failed to respond to all known forms of treatment. May the answer to the question "What is the etiology of arthritis?" lie in this group?

One is impressed by the multiplicity of measurable systemic changes occurring over a period of years in a group of arthritics. This observation suggests separate, detailed studies of the different body systems and their functions in arthritics.

This paper presents one such study, which deals with the sugar tolerance reaction in 222 arthritics. Naturally in a study of sugar tolerance reactions in arthritis, a number of vital factors illustrating many different aspects of arthritis are incorporated in order to ensure the validity of the clinical conclusions drawn from these tests. A comparison of the functional status of one group of patients observed over a period of three years or longer was made to

groups. The first group showed a normal curve. Normal was one in which the fasting blood did not exceed 120 mg of sugar per 100 mg of blood, in which none of the readings exceeded 170 mg, and in which the fourth reading was less than 130 mg. Ninety-five of the 222 arthritics came into this normal group. The second group was termed "Slightly Abnormal." It included those whose curve followed normal lines, but in which one or more of the bloods during the test exceeded 170 mg. In this group there were 51 patients. The third group, termed "Moderately Abnormal," included those whose final blood reading was above 130 mg of sugar. Thirty-nine patients came into this group. The fourth group, "Markedly Abnormal," showed a tolerance definitely low, the bloods well above 170 mg, and the final blood above 130 mg. There were 37 patients in this group.

There were but four arthritics among the 222 tested who had a high fasting blood sugar, or who could be considered as diabetics. The remaining patients were not diabetics, and to date have not become diabetics.

A brief explanation of the headings used follows. Activity is an arbitrary term, used to designate arthritic activity. Increasing joint involvement, or joint involvement showing itself in local tenderness, pain, heat or swelling (redness of the joints present or not present) was considered the index of activity. Clinical Heart is used to describe definite variation from the accepted normal heart function. Under Nephrop-

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†Follin method. Technique: 15 grams dextrose per each kilogram of body weight. Venous blood drawn and sugar content determined. Fasting blood and three subsequent bloods drawn at three quarters of an hour, one hour and a half and two and a half hours after the dextrose is ingested.

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athies are those showing variations in urine, not accepted as normal, that is showing intermittently or constantly albumin, casts, red or white blood cells. Under *Sugar in Urine* are those showing green color reaction obtained with the Benedict test if reported constantly for some time, and those showing in addition varying amounts of yellow precipitate, or a measurable quantity of sugar—Under *Tissue Change* are listed those obese, and those showing marked loss of weight,—15 to 25 pounds within a year, and those markedly emaciated and below the average weight standards. *Type 1 Arthritis* refers to the so-called Atrophic or Rheumatoid types. *Type 2*, to the Hypertrophic or Osteo-arthritis. *Mixed Type* to those showing a combination of Type 1 and Type 2, plus. To save incessant repetition NST is used as an abbreviation of *Normal Sugar Tolerance*, and A S T for *Abnormal Sugar Tolerance*.

One hundred and twenty-seven, or 57 per cent, of the total group showed A. S. T. Ninety-five, or 43 per cent, showed N. S. T. Comparison of the N. S. T. and A. S. T. by types of arthritis shows

30 years in the A S T group, the highest percentage, 28 per cent, were in the 31-40 decade.

DURATION OF ARTHRITIS In the N S T group, the highest percentage, 24 per cent, duration 6-10 years, next highest percentage, 21 per cent, duration of months. In the A S T group, highest percentage, 21 per cent, duration 6-10 years, next highest percentage, 13.5 per cent duration of months. This suggests that the actual duration of the arthritis, considered separately, has no marked bearing on the sugar tolerance variations.

FOCAL INFECTION Tonsils, teeth and antra are said to represent the origin of 85 per cent of infections entering the body. The N S T group showed 59 per cent with tonsils present, 12 per cent with infected teeth, and 6 per cent with infected antra. The A S T group showed 55 per cent with tonsils, 14 per cent with infected teeth, and 6 per cent with infected antra.

This illustrates one of the precautionary warnings suggested in the beginning of the study, that is that no one factor in arthritis can

	Type 1	Type 2	Mixed Type	Struempell-Marie	G C Arth	Rheumatic Syndrome	Tubercular Arthritis
N S T	44%	20%	12%	15%	5%	3%	1%
A S T	32%	33%	20%	9%	5%	1%	—

Ninety-nine, or 45 per cent of the entire group, were males, 123, or 55 per cent, females. Of the N S T group, 54 per cent were males, 46 per cent females. Of the A S T group, 38 per cent were males, 62 per cent females.

AGE VARIATIONS In the group with N S T the highest percentage, 36 per cent, were under

be considered as complete, nor conclusions be drawn from it alone, because if one considered the above figures separately, the natural conclusion would be that the presence of focal infections was nearly a fifty-fifty proposition*.

*Focal Infection in the Arthritic will be taken up in a future paper.

TISSUE CHANGE	Obese	Loss Weight
N S T	3%	35%
A S T	5%	41%

ACTIVITY	Fever	Elevated Blood Pressure	Clinical Heart	Radio-graphic Sclerosis	Sugar Urine	Nephropathies
N S T	41%	11%	22%	45%	1%	16%
A S T	48%	16%	31%	36%	17%	23%

ENTIRE GROUP STUDIED—222 ARTHRITICS

TYPES OF ARTHRITIS						
Type 1	Type 2	Mixed Type	Struempell Marie	G C Arthritis	Rheumatic Syndrome	Tubercular Arthritis
37%	28%	17%	11%	4.5%	2%	5%

TYPE 1—83 Patients

		N S T Group 50%			A S T Group 50%							
	Male	Female	Tissue Change	Active	Fever	Clinical Heart	Radio Sclerosis	Su gar	Nephropathies	Ton sil	Teeth	Antra
N S T	31%	69%	38%	50%	30%	12%	18%	2%	12%	38%	7%	5%
A S T	20%	80%	59%	56%	50%	20%	11%	17%	22%	39%	12%	5%

Age In NST group, highest percentage, 48 per cent under 30 years, 43 per cent 31-40 years

In A ST group, highest percentage, 44 per cent 31-40 years, 22 per cent under 30 years, and another 22 per cent from 41 to 50 years

Duration In NST group, highest percentage, 24 per cent with duration of months, 24 per cent with duration 6-10 years

In A ST group, highest percentage, 17 per cent with duration 2 years, 17 per cent with duration 6-10 years

Comment In type 1, the A ST group show a definitely higher percentage showing tissue change, fever, clinical heart, sugar in urine, nephropathies and infected teeth. Apparently the actual duration of the arthritis is of less importance than is the individual reaction to remission and relapse of the disease

TYPE 2—61 Patients

	NST Group 31%			A ST Group 69%			
	Tissue Change	Active	Fever	Clinical Heart	X Ray Sclerosis	Sugar Urine	Nephropathies
NST	11%	21%	11%	11%	80%	—	16%
A ST	26%	33%	26%	45%	54%	12%	24%

	Elevated Blood Pressure	Tonsils	Teeth	Antra	Male	Female
NST	21%	84%	31%	5%	68%	32%
A ST	29%	71%	7%	7%	48%	52%

Age In the NST group, highest percentages 42 per cent from 51-60 21 per cent 41-50 years, and 21 per cent 61-70 years

In the A ST group, highest percentages, 45 per cent from 51-60 years, 27 per cent from 61-70

Duration In the NST group, highest percentages, 26 per cent with duration of months, 21 per cent with duration 5 years

In the A ST group, highest percentages, 21 per cent duration of months, 19 per cent duration 6-10 years

Comment In Type 2, the A ST group again show a definitely higher percentage with tissue change, fever, clinical heart, sugar in urine and nephropathies, but the NST group show the higher percentage of infected teeth

MIXED TYPE—37 Patients

	NST Group 30%			A ST Group 70%			
	Tissue Change	Active	Fever	Clinical Heart	X Ray Sclerosis	Sugar Urine	Nephropathies
NST	54%	18%	18%	45%	55%	—	27%
A ST	35%	46%	54%	35%	55%	23%	31%

	Elevated Blood Pressure	Tonsils	Teeth	Antra	Male	Female
NST	27%	82%	—	18%	54%	46%
A ST	15%	73%	19%	12%	35%	65%

Age In the NST group, highest percentages, 64 per cent from 41-50 years, 36 per cent from 51-60

In the A ST group, highest percentages, 38 per cent from 51-60 years, 27 per cent from 41-50

Duration In the NST group, highest percentage, 45 per cent with duration of months

In the A ST group, highest percentage, 31 per cent with duration from 6-10 years

Comment In contrast to the findings in Types 1 and 2, the A ST observations in the Mixed Type show a reversal of percentages. In the Mixed Type, the NST group show the higher percentage with tissue change, clinical heart and elevated blood pressure, while the A ST group continue to show the greater number with activity, fever, sugar in the urine, nephropathies and infected teeth

STRUEMPPELL MARIE TYPE—24 Patients

	NST Group 58%					A.S.T. Group 42%						
	Male	Female	Tissue Change	Active	Fever	Clinical Heart	X Ray Sclerosis	Sugar Urine	Nephropathies	Tonsils	Teeth	Antra
NST	86%	14%	50%	57%	28%	28%	8%	—	14%	50%	7%	—
A.S.T.	80%	20%	50%	70%	20%	10%	17%	20%	20%	20%	20%	—

Age In the NST group, highest percentages, 57 per cent under 30 years, 36 per cent from 31-40

In the A.S.T. group, highest percentages, 50 per cent under 30 years, 50 per cent from 31-40

Duration In the NST group, highest percentage, 57 per cent duration 6-10 years

In the A.S.T. group, highest percentage, 30 per cent duration 6-10 years

Comment In this group, the A.S.T. show a higher percentage with active arthritis, sugar in urine, nephropathies and infected teeth, whereas the NST group show more with fever, clinical heart and definitely more with tonsils

Gonorrheal Arthritis—11 patients—NST 45 per cent, A.S.T. 55 per cent

Rheumatic Syndrome—5 patients—NST 60 per cent, A.S.T. 40 per cent

Tubercular Arthritis—1 patient—NST 100 per cent

TISSUE CHANGE

Ten patients, or 5 per cent of the 222 arthritics, were obese Eighty-five, or 39 per cent,

showed marked loss of weight Of the latter group, 39 per cent were in the NST Group and 61 per cent in the A.S.T. Group

WEIGHT LOSS GROUP—85 Patients

	Type 1	Type 2	Mixed Type	Struempell Marie	Gonorrheal Arthritis	Rheumatic Syndrome	Tubercular Arthritis
NST	45%	7%	18%	21%	3%	3%	3%
A.S.T.	46%	21%	18%	10%	4%	1%	—

	Active	Fever	Clinical Heart	X Ray Sclerosis	Sugar Urine	Nephropathies
NST	55%	43%	12%	29%	—	21%
A.S.T.	60%	48%	35%	29%	15%	29%

	Elevated Blood Pressure	Tonsils	Teeth	Antra	Male	Female
NST	3%	36%	3%	3%	51%	49%
A.S.T.	10%	40%	18%	8%	46%	54%

Age In the NST group, highest percentages, 39 per cent under 30 years, 33 per cent from 31-40

In the A.S.T. group, highest percentages, 35 per cent from 31-40 years, 20 per cent under 30

Duration In the NST group, highest percentages, 24 per cent with duration 6-10 years, 18 per cent with duration 2 years

In the A.S.T. group, highest percentages,

20 per cent with duration 2 years, 18 per cent with duration 6-10 years

Comment In this group of arthritics with marked weight loss approximately the same percentage of group NST and A.S.T. appear in the different types of arthritis, except in Type 2, which showed a much higher percentage of A.S.T. than NST Disregarding type of arthritis, the A.S.T. group with weight loss showed higher percentage of clinical heart, sugar in urine and infected teeth

BLOOD PRESSURE

Thirty, or 14 per cent of the entire group, showed elevated blood pressure Of this 30, 33 per cent were in the NST group, 67 per cent in the A.S.T. group

Clinical Heart—60 patients—27% of entire group NST Group 35% A.S.T. Group 65%
*X Ray Sclerosis**—72 patients—37% of those on whom x rays were taken NST Group 44% A.S.T. Group 56%
 *Arteriosclerosis comparisons have not been stressed in this paper as a study of Arteriosclerosis in Arthritis is now in the process of preparation

Sugar in Urine—23 patients—10% of entire group
NST Group 4% AST Group 96%

Nephropathies—44 patients—20% of entire group
NST Group 34% AST Group 66%

Active—100 patients—45% of entire group
NST Group 39% AST Group 61%

Fever—76 patients—34% of entire group
NST Group 31% AST Group 69%

Comment In the patients showing clinical hearts, sugar in urine nephropathies, activity of arthritis fever and elevated blood pressure, a definitely higher percentage occurs in the A S T group than in the N S T group

AGE

Twenty-two per cent of the entire group were under 30, 27 per cent between 31 and 40, 19 per cent between 41 and 50, 21 per cent between 51 and 60, 9 per cent between 61 and 70, and 2 per cent over 70

	Under 30 yr	31-40 yr	41-50 yr	51-60 yr	61-70 yr	Over 70 yr
NST	71%	43%	38%	28%	20%	40%
A.S.T	29%	57%	62%	72%	80%	60%

Comment The N S T group showed the higher percentage only in the youngest group of patients, that is, in those under thirty years of age. The A S T group showed the higher percentage in each of the succeeding decades

SEX

	Males 99 or 45 per cent of entire group	Females 123, or 55 per cent
NST	51%	36%
A.S.T	49%	64%

FOCAL INFECTION

	Tonsils (125—56%)	Teeth (29—13%)	Antra (14—6%)
NST	44%	38%	43%
A.S.T	56%	62%	57%

Finally, as to the possible prognostic value of the sugar tolerance test. A comparison of the functional status, from an arthritic point of view, of those of the entire group followed three years or over, was made, and the following points brought out

One hundred and forty-five patients were observed over this period. At the present time 31, or 21 per cent, are dead, 56, or 39 per cent, lead fairly normal lives with no joint handicap, 25, or 17 per cent, are ambulatory, showing moderate crippling, and 33, or 23 per

cent, show marked joint crippling and disability. Dividing this group as they had reacted to the sugar tolerance test while in the hospital we have

	No Joint Handicap	Ambu- latory	Marked Crippling	Dead
NST	50%	50%	33%	56%
A.S.T	50%	50%	67%	64%

Of those who went on to marked crippling, it is interesting to note that 13 of the 23 who had shown *abnormal* sugar tolerance had also shown marked loss of weight, while 3 of the 10 who had shown *normal* sugar tolerance had shown weight loss. Tonsils and teeth as foci of retained infection are present in higher percentages in the A S T group than in the N S T group. No other marked difference as regards disease complications were noted between the N S T and A S T groups. Therefore, it appears that a natural query is, if there is no distinct difference in complicating diseases as such in either the N S T or A S T group, may there be a greater dependence or relationship to the disturbances of the homeostatic systems and less to the disease entities and focal infections than heretofore has been proved? Another interesting observation is that if the dead and those showing marked crippling are combined, there are 64 out of the 145 who may be considered to belong to our "problematical" group of arthritics. Forty-three, or 68 per cent, of this last group had shown abnormal sugar tolerance, while 20, or 32 per cent, had shown a normal tolerance.

SERIAL SUGAR TOLERANCE TESTS

A small group of 33 patients were given sugar tolerance tests repeatedly over periods of from one to nine years. Twenty-two of this group showed tests which remained in the A.S.T. group constantly, irrespective of activity or inactivity of arthritis, or of any other systemic variation.

Of the twenty-two, fourteen had at no time positive tests for sugar in any of the routine urinalyses during the entire period they were observed. Five of the fourteen did show a slight trace of sugar in the urine during the sugar tolerance test, at the time when the blood showed a reading above 200. This point is of particular interest. Why in this group of arthritics does the threshold of leakage of sugar through the urine not appear until the blood sugar is 200 or over, when in the average person it is expected when the blood sugar reaches 180 mg? In this group certainly a marked disturbance in the homeostatic control of the blood sugar is suggested. Eight patients out of the twenty-two who continued in the A S T group over the years showed at various times questionable signs of sugar in routine urinalyses.

None of the eight, however, showed constantly sufficient sugar to classify them as diabetics. Eleven of the thirty-three in this group with serial tolerance tests showed abnormal curves in the first test but normal, or very slightly abnormal, curves in the last test. No outstanding observations were made in this group.

Comment It is obvious from the above figures that an abnormal sugar tolerance individual does not become necessarily a normal one with cessation of activity of joints or with the subsidence of infection. Also an abnormal sugar tolerance over a period of years is not indicative of potential diabetes in this group.

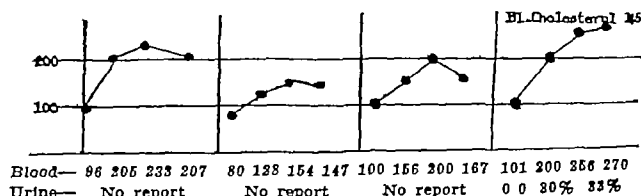
A summary of the medical history of one of the cases so followed may be of interest. This individual was a woman first seen at the Robert Brigham Hospital at the age of 47, six years after the onset of her arthritis. Her family tissue inheritance was fair. Her married history was irrelevant as given except for great emotional strain over a period of years. The past history was essentially negative except for constipation of long standing. It took ten years from the onset of fleeting pains about the region of the joints for her arthritis to progress to marked deformity of the hands, flexion contraction of the knees with limited motion, and moderate involvement of the ankles. At the time of her admission to the hospital she had not walked for two years. On admission, the only positive physical findings were the presence of abnormal tonsils and limitation of joint motion with deformity. Radiograms showed destruction of cartilage, narrowing of joint spaces, bone absorption and thinning. This pa-

tient has been followed in and out of the hospital for ten years. During this time posterior capsuloplasty was performed on both knees with subsequent marked improvement in her functional activity. Her basal metabolism remained practically within normal limits, her vital capacity about half normal. At the present time she is able to lead a fairly normal life, walking without support, and with very little difficulty, doing her own housework. The last x rays showed increased calcium deposition in the bones. During the entire period of observation there has been no demonstrable activity of the arthritis. This patient has carried her tonsils throughout this time and still has them at the age of 57 after 16 years' duration of her arthritis. There has been present at times localized infection of the tonsils, during one such attack her blood sedimentation rate was somewhat high, but at this time her white count was only 8,300. However, in spite of these tonsils the patient has not shown general systemic reaction to bacteria or infection. The striking point in this chart is that while the urine remained negative throughout the years, except for the small amount of sugar shown during the test with the high blood sugars, the sugar tolerance test remained abnormal, and the last test showed the lowest tolerance of any recorded.

To sum up the study of the arthritic. There is no question but that the general statement is basically correct that the arthritic is not merely a matter of joint pathology. There is, besides disturbance of the fluid content of the body, disturbance of the water and salt content

SUGAR TOLERANCE CHART—CASE NO 333

TYPE 1 ARTHRITIS



	1924 April	1925 January	1925 April	1933 August
Age	48 years	49 years	49 years	57 years
Duration	7 years	8 years	8 years	16 years
Weight	Normal— 130 lbs	No marked change	No marked change	No marked change
Activity	Inactive	Inactive	Inactive	Inactive
Blood Pressure	Low	Low	Low	Low
Clinical Heart	Negative	Negative	Negative	Negative
Urine	Negative	Negative	Negative	Negative
Foot Infection	Tonsils	Tonsils	Tonsils	Tonsils
Temperature	Normal	Normal	Normal	Normal
X-Ray Arteries	No sclerosis	No sclerosis	No sclerosis	No sclerosis

of the blood, there is disturbance of the normal homeostasis* of blood sugar, protein, fat, calcium and phosphorus. The maintenance of adequate oxygen supply to the tissues is altered. There is a question as to the degree of alteration of the homeostasis of blood neutrality. There is definite alteration of the PH content of tissue. There is definite alteration in the constancy of body temperature and basal metabolism. There is no question about the disturbance in the general functions of the sympathetic and parasympathetic nervous systems. There are definite changes in the general features of body stabilization.

During the past two years' work with the Robert Brigham Hospital Survey of Chronic Disease, this definite impression, though not a measurable fact, has been noted. In an arthritic in Type 1, or in the Mixed Type Groups, a history of marked loss of weight, activity of joints, febrile chart, easy reaction to infection, clinical heart change from normal, variations from normal in urinalyses, a history of emotional instability, or evidence of an unstable nervous system, plus an abnormally low sugar tolerance, are indications of a poor prognosis. The addition of poor inheritance and poor environment to the other poor prognostic signs may be the deciding factors tipping the scale downward for the individual to whom they apply. These may be the factors which produce his disastrous reaction to bacteria, toxin, or allergy, which the more fortunate arthritic overcomes, or handles with less eventual destruction of bone, joint and tissue. The disturbances of the various portions of the body functions are so widespread in their distribution and character in arthritis that a natural query is: May the etiology of arthritis lie in disturbed functions of the pancreas, liver or adrenals without a diabetic syndrome being present?

SUMMARY

- 1 A study of the sugar tolerance in 222 arthritics was made. Fifty-seven per cent of these patients showed an abnormal tolerance as contrasted to 43 per cent with normal tolerance. Careful analyses from the point of view of sex, age, duration of arthritis, activity of arthritis, fever, elevated blood pressure, tissue change, arteriosclerosis, demonstrable foci of infection, and heart and urinary changes showed no marked difference between the normal and abnormal sugar tolerance groups. Those with normal

sugar curves and those with abnormal showed a certain amount of infection, activity, fever and systemic abnormalities. There was a slightly higher percentage of these changes in the abnormal group than in the normal.

- 2 Forty-eight patients were in the AGE GROUP under 30 years. Seventy-one per cent of these showed a normal sugar tolerance. In each succeeding age group, the majority fell in the abnormal sugar tolerance group.
- 3 Of the 85 patients with marked loss of weight, those with abnormal sugar tolerance showed a forty per cent higher incidence of activity of arthritis, of fever, and of abnormal hearts and urines than did those with normal sugar tolerance.
- 4 One hundred and forty-five of the 222 arthritics have been under observation for three or more years. A comparison of their functional status at the present time showed that those with no joint handicap and those with mild joint involvement are divided equally between the normal and abnormal sugar tolerance groups. It seems important to emphasize that the combined groups, comprised of those who have died or who have progressed to more extensive joint involvement and marked crippling, showed 68 per cent who had had abnormal sugar tolerance tests as contrasted with 32 per cent with normal tests. Therefore, it appears that a low sugar tolerance is of prognostic value in a patient with Type 1 or Mixed Type arthritis, if such a patient gives a history of marked weight loss and shows abnormal heart function and urinary changes, and we believe such prognosis to be poor.
- 5 Serial sugar tolerance tests covering one to nine years on a group of 33 patients showed that even a markedly low sugar tolerance does not per se indicate a future diabetic. Instances are given of sugar tolerances remaining definitely low over a period of nine years without the appearance of the slightest signs or symptoms of diabetes. These serial tests have also shown that in an arthritic the low sugar tolerances do not always return to normal at the time of cessation of activity of the arthritis, or in the absence of demonstrable infection.
- 6 Because of the multiple involvement of the body defenses in the "problematical group" of arthritics, the query arises as to whether the etiology of the disease may not lie in change in function of the pancreas, liver, adrenals, or pituitary affecting the autonomic control of the body.

Cannon, Walter B. "The Wisdom of the Body." Page 24.
"The coordinated physiological processes which maintain most of the steady states in the organism are so complex and so peculiar to living beings—involving as they may the brain and nerves, the heart, lungs, kidneys and spleen—all working cooperatively—that I have suggested a special designation for these states: *Homeostasis*. It means a condition—a condition which may vary but which is relatively constant."

MEDICAL PROGRESS

CARDIOVASCULAR REVIEW FOR 1932

BY PAUL D WHITE, M D *

(Continued from last week)

Bacterial endocarditis *Acute*—Dickar has reported 2 cases of acute bacterial endocarditis caused by the *Bacterium acidilactici*

Lord has studied 23 cases of pneumococcus endocarditis autopsied at the Massachusetts General Hospital. In 8 of these 23 cases, there was chronic as well as acute endocarditis. The left side of the heart alone was involved in 18 cases, the right alone in 3, and both sides in 2. The mitral valve was affected in 13 instances, the aortic in 12, and both in 5. The tricuspid valve was involved in 5, including one with involvement of the pulmonary valve also. Lord has known of no definitely established case of recovery. Fourteen of 337 cases of lobar pneumonia autopsied between 1898 and 1929 showed acute endocarditis (4.15 per cent).

Phipps has reported an analysis of 44 cases of acute bacterial endocarditis autopsied at the Boston City Hospital from 1914 to 1929, exclusive of pneumococcus endocarditis. Thirty-two were males and 12 were females. The commonest age was forty-five to fifty years. In about 60 per cent of the cases there was evidence of old pathology in the endocardium, particularly arteriosclerosis. The organism most commonly responsible was the *Streptococcus hemolyticus*, in 21 of the 44 cases. Second was the *Staphylococcus aureus* in 11 cases, third the *B. coli communis* in 5 cases, while infrequently were found the gonococcus, 2 cases, meningococcus, 2 cases, staphylococcus albus, 1 case, *Streptococcus hemolyticus* plus *Staphylococcus aureus*, 1 case, and *B. coli communis* plus *Staphylococcus aureus*, 1 case. The duration of life ranged from three days to three weeks.

Dickar L. Acute bacterial endocarditis due to bacterium acidilactici Arch Int Med 49 788 1932

Lord F T Pneumococcus endocarditis New Eng J Med. 207 767 1932

Phipps C Acute bacterial endocarditis New Eng J Med. 207 768 1932

Subacute—Morrison has analyzed a large series of cases of subacute bacterial endocarditis seen in six Boston hospitals in the four years, 1928 to 1931 inclusive. There was a total of 177 such cases, while during the same period of time in the same hospitals there were 772 cases of rheumatic fever, the ratio was about

3 to 10, except at the Children's Hospital where the ratio was only 4 to 100. The *Streptococcus viridans* was responsible for the great majority of cases (113 out of 135 with positive blood cultures). Out of 203 cases 134 were rheumatic in background, 11 were congenital, 3 luetic, and 1 arteriosclerotic. The mitral valve alone was involved in 25 cases, the aortic alone in 18, both valves in 38, and other valves in 8.

Morrison H. Subacute streptococcus endocarditis. New Eng J Med 207 770 1932

Cardiovascular syphilis—Stadler has written a small book on syphilis of the heart and blood vessels, giving in an interesting way an analysis of statistics concerning cardiovascular syphilis found in the literature, and concluding with chapters on prognosis and treatment. He believes that in spite of occasional or even frequent disappointments, fairly vigorous anti-luetic therapy should be carried out in most cases beginning with bismuth (in preference to mercury) and going on to arsenic, with iodide given while these courses are going on. He advises two full courses the first year, and after that one course a year. Early intensive arsenic treatment of primary syphilis has not seemed to decrease the later incidence of aortitis, some statistics suggest that it causes an increase.

Moore, Dangle and Reisinger have studied syphilitic aortitis uncomplicated by aortic regurgitation or aneurysm and found in the twenty-year period from 1910 to 1930 at the Johns Hopkins Hospital 105 patients who showed this condition at postmortem examination. The clinical diagnosis was correctly made in only 4 of these 105 cases, in 13 more something was suspected to be wrong with the aorta. An additional 35 of the 105 cases might have been correctly diagnosed if careful attention had been paid to all symptoms and signs. Thirty-four of the series died with hearts and aortas thought clinically to be normal. Hypertension was an infrequent accompaniment of syphilitic aortitis. The Wassermann reaction was positive in 75 per cent of the cases. Seven suggestive symptoms and signs are (1) roentgen-ray evidence of aortic dilatation, (2) increased retrosternal dullness, (3) dyspnea on exertion, (4) tympanitic aortic second sound, (5) progressive heart failure, (6) substernal pain, and (7) paroxysmal dyspnea.

*White—Physician Massachusetts General Hospital. For record and address of author see This Week's Issue page

Moore, Danglade and Reisinger have also published an important paper on the subject of the treatment of cardiovascular syphilis, based on studies of 53 patients with aortic aneurysm and 112 with aortic regurgitation. "Not one of 117 patients with early syphilis who received three or more courses of arsphenamine, and treatment with mercury during periods between the courses, presented any evidence of cardiovascular involvement during the period of observation, while 24 of 285 patients who had received less than this amount of treatment were observed to acquire syphilitic aortitis, aneurysm, or aortic regurgitation. Adequate treatment for early syphilis almost certainly protects the majority of patients so treated against subsequent cardiovascular syphilis. Of 6,420 patients from our own clinic with various forms of late syphilis, 10 per cent had cardiovascular syphilis (clinically). Of the total number 27 per cent had aortic regurgitation and 12 per cent aortic aneurysm.

Cardiovascular syphilis is twice as common in males as in females and about twice as common in the Negro as in white patients.

The majority of cases of aneurysm and aortic regurgitation occur in the fifth decade of life. The average interval of time between infection and the development of cardiovascular symptoms is about twenty years.

The actual incidence of complicating neurosyphilis was about 35 per cent (concealed in half).

Eighty-nine per cent of our patients had never received any treatment for syphilis before the development of cardiovascular syphilis. Of the remainder not one had received adequate treatment for early syphilis." The authors describe their method of cautiously using mercury, bismuth, the iodides, neoarsphenamine, and bismarsen in small doses over periods of years as follows. Begin with intramuscular injection of insoluble bismuth salt, 0.1 gram every four or five days for a few weeks, then give 0.2 gram once a week until a total interval of ten to twelve weeks on bismuth therapy has elapsed, give simultaneously with the bismuth potassium iodide or sodium iodide by mouth, 13 grams three times daily, increasing to 4 grams three times daily. At the end of this period of ten to twelve weeks, change to neoarsphenamine or bismarsen (bismuth arsphenamine sulphonate) 0.05 to 0.1 gram once a week, increasing to maximum dose of 0.3 gram (rarely 0.45 to 0.6 gram) for ten to twelve weeks, the bismarsen to be given to the less favorable cases, after the bismarsen or neoarsphenamine course, return at once without pause to the insoluble bismuth and iodide therapy, alternate these two courses over a minimum time interval of two years, then institute long periods of rest with an occasional course of bismuth followed by one of bismarsen or neoarsphenamine, averaging once a year for the duration of life.

The authors have obtained the following re-

sults by this therapy. Fifteen cases of well-treated aortic aneurysm gave 40 per cent mortality, with average duration of life of seventy-five months, as compared with a mortality of 90 per cent in the same interval of time and a duration of life of only nineteen months for 22 cases of aortic aneurysm receiving little or no treatment. Twenty-five cases of well-treated luetic aortic regurgitation gave a mortality of 16 per cent and duration of life of seventy-one months, as compared with 91 per cent mortality and three months' duration of life for 57 cases receiving little or no treatment. Out of 56 surviving cases of this treated series 21 were symptom-free and able to work, 26 had persistent symptoms but could carry on light work, and 9 were incapacitated. Fifty-seven of the whole group of 165 cases died of progressive cardiac failure, 28 (10 cases of aneurysm and 18 of aortic regurgitation) died suddenly, 11 died of unknown cause, and 13 died of other than cardiovascular causes. A fixed positive Wassermann reaction is the rule in cardiovascular syphilis and so may be completely disregarded.

The authors conclude from the analysis of their material "that properly supervised anti-syphilitic treatment, with adequate general medical care, given to patients with aneurysm or aortic regurgitation, prolongs life, alleviates symptoms, maintains the ability to pursue a gainful occupation, and reduces the period of incapacity."

Blackford and Boland have reported their experience in the treatment of 100 cases of aortic syphilis. Twenty-five out of 28 carefully studied cases had pain and this pain was relieved in all but one case by the intramuscular injection of sodium bismuth tartrate (routinely 20 cc of a 15 per cent solution twice a week in courses of ten injections). "This drug can be administered over long periods with good results. Fifty patients with heart disease associated with syphilis were also treated with bismuth. Marked clinical improvement was usually noted. Congestive heart failure in cardiovascular syphilis urgently demands the immediate administration of bismuth, general measures for the treatment of the failing heart are not enough." Salyrgan as a diuretic may help a good deal. Potassium iodide is to be given orally also.

Blackford L. M. and Boland J. H. Bismuth in treatment of cardiovascular syphilis. J. A. M. A. 99 1902 1932.

Moore J. E., Danglade J. H. and Reisinger J. C. Diagnosis of syphilitic aortitis uncomplicated by aortic regurgitation or aneurysm. Comparison of clinical and necropsy observations in one hundred and five patients. Arch. Int. Med. 49 763 1932.

Moore J. E., Danglade J. H. and Reisinger J. C. Treatment of cardiovascular syphilis: results obtained in fifty-three patients with aortic aneurysm and in one hundred and twelve with aortic regurgitation. Arch. Int. Med. 49 879 1932.

Stadler E. Syphilis des Herzens und der Gefäße. Verlag von Theodor Steinkopff 1932. 82 pages.

Other infections—Place has written of his experiences with heart disease resulting from

MEDICAL PROGRESS

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Bacterial endocarditis *Acute*—Dickar has reported 2 cases of acute bacterial endocarditis caused by the *Bacterium acidilactici*.

Lord has studied 23 cases of pneumococcus endocarditis autopsied at the Massachusetts General Hospital. In 8 of these 23 cases, there was chronic as well as acute endocarditis. The left side of the heart alone was involved in 18 cases, the right alone in 3, and both sides in 2. The mitral valve was affected in 13 instances, the aortic in 12, and both in 5. The tricuspid valve was involved in 5, including one with involvement of the pulmonary valve also. Lord has known of no definitely established case of recovery. Fourteen of 337 cases of lobar pneumonia autopsied between 1898 and 1929 showed acute endocarditis (4.15 per cent).

Phipps has reported an analysis of 44 cases of acute bacterial endocarditis autopsied at the Boston City Hospital from 1914 to 1929, exclusive of pneumococcus endocarditis. Thirty-two were males and 12 were females. The commonest age was forty-five to fifty years. In about 60 per cent of the cases there was evidence of old pathology in the endocardium, particularly arteriosclerosis. The organism most commonly responsible was the *Streptococcus hemolyticus*, in 21 of the 44 cases. Second was the *Staphylococcus aureus* in 11 cases, third the *B. coli communis* in 5 cases, while infrequently were found the gonococcus, 2 cases, meningococcus, 2 cases, staphylococcus albus, 1 case, *Streptococcus hemolyticus* plus *Staphylococcus aureus*, 1 case, and *B. coli communis* plus *Staphylococcus aureus*, 1 case. The duration of life ranged from three days to three weeks.

Dickar L. Acute bacterial endocarditis due to bacterium acidilactici. Arch Int Med 49 788 1932

Lord F T. Pneumococcus endocarditis. New Eng J Med. 207 767 1932

Phipps C. Acute bacterial endocarditis. New Eng J Med. 207 768 1932

Subacute—Morrison has analyzed a large series of cases of subacute bacterial endocarditis seen in six Boston hospitals in the four years, 1928 to 1931 inclusive. There was a total of 177 such cases, while during the same period of time in the same hospitals there were 772 cases of rheumatic fever, the ratio was about

3 to 10, except at the Children's Hospital where the ratio was only 4 to 100. The *Streptococcus viridans* was responsible for the great majority of cases (113 out of 135 with positive blood cultures). Out of 203 cases 134 were rheumatic in background, 11 were congenital, 3 luetic, and 1 arteriosclerotic. The mitral valve alone was involved in 25 cases, the aortic alone in 18, both valves in 38, and other valves in 8.

Morrison H. Subacute streptococcus endocarditis. New Eng J Med. 207 770 1932

Cardiovascular syphilis—Stadler has written a small book on syphilis of the heart and blood vessels, giving in an interesting way an analysis of statistics concerning cardiovascular syphilis found in the literature, and concluding with chapters on prognosis and treatment. He believes that in spite of occasional or even frequent disappointments, fairly vigorous anti-luetic therapy should be carried out in most cases beginning with bismuth (in preference to mercury) and going on to arsenic, with iodide given while these courses are going on. He advises two full courses the first year, and after that one course a year. Early intensive arsenic treatment of primary syphilis has not seemed to decrease the later incidence of aortitis, some statistics suggest that it causes an increase.

Moore, Danglede and Reisinger have studied syphilitic aortitis uncomplicated by aortic regurgitation or aneurysm and found in the twenty-year period from 1910 to 1930 at the Johns Hopkins Hospital 105 patients who showed this condition at postmortem examination. The clinical diagnosis was correctly made in only 4 of these 105 cases, in 13 more something was suspected to be wrong with the aorta. An additional 35 of the 105 cases might have been correctly diagnosed if careful attention had been paid to all symptoms and signs. Thirty-four of the series died with hearts and aortas thought clinically to be normal. Hypertension was an infrequent accompaniment of syphilitic aortitis. The Wassermann reaction was positive in 75 per cent of the cases. Seven suggestive symptoms and signs are (1) roentgen-ray evidence of aortic dilatation, (2) increased retrosternal dullness, (3) dyspnea on exertion, (4) tympanitic aortic second sound, (5) progressive heart failure, (6) substernal pain, and (7) paroxysmal dyspnea.

*White—Physician Massachusetts General Hospital. For record and address of author see This Week's Issue page 44.

and arteriosclerosis" The chief complications were heart failure (cause of 50 per cent of the deaths), infections (14.2 per cent of the deaths), apoplexy (13.4 per cent of the deaths) and renal failure (10.4 per cent of the deaths) "Arteriosclerosis of the renal vessels is a constant and characteristic feature of essential hypertension at autopsy" "Histologically the principal lesion is an arteriosclerosis The wide variety of symptoms and signs appears to depend upon the extensiveness, the rate of progress, the severity, and the location of the arteriosclerosis The clinical and histological observations on Group 3 (so called malignant hypertension) differ from those in Group 2 (benign) only in degree All of the symptoms and histological lesions observed we believe, may be produced by arteriosclerosis alone" The heart weights were below 400 grams in only 18.13 per cent of all the cases

Wiggers has written that "careful evaluation of the experimental and clinical evidence leads to the conclusion that the circulatory changes in clinical hypertension are usually produced by the combined effects of increased peripheral resistance and decreased elasticity of the aorta" He adds further, "The question may now be raised whether it is advisable to lower blood pressures in hypertension unless real dangers appear to be impending I have repeatedly demonstrated experimentally, for example, that amyl nitrite, contrary to general belief, reduces blood flow through the coronary and cerebral vessels Obviously such lowering of blood pressure defeats the purpose of natural compensatory mechanisms, and at times may actually be dangerous"

Stieglitz considers that the degree to which the diastolic blood pressure approaches normal on the administration of nitrites may be taken as an index of the ability of the arteries to relax in cases of essential hypertension Thus, he considers the test a valuable one for prognosis

Elberg and Skulskiy have studied the effect of calcium thiocyanate therapy in 63 patients with hypertension The drug was given in doses of 0.05 gram (1 grain) three times daily after meals and continued for periods of eight weeks Favorable results occurred and lasted sometimes for ten months, success was noted in 90 per cent of the cases

Goldring and Chasis have reported 74 trials of thiocyanate therapy in 50 patients, 46 with essential hypertension and 4 with chronic diffuse glomerulonephritis The drug was 31 per cent effective in lowering blood pressure in the whole series, including success in 3 of the 4 patients with nephritis Toxic manifestations occurred in 17 per cent of the total group, but in none of the 4 nephritic cases Toxic symptoms consisted of psychosis in 6 cases, nausea in 3, fatigue without nausea in 1, dermatitis in 1,

and collapse resulting in death in 2 The dosage found to be most effective in lowering blood pressure and least often attended by toxic manifestations was 0.326 gram (5 grains) given daily over a period of from fourteen to seventy-eight days The authors conclude that the "uncertainty regarding proper dosage, coupled with the fact that frequently there is slight if any difference between the amounts that produce therapeutic and toxic effects lead us to believe that thiocyanate will have a much restricted usefulness in clinical medicine"

Palmer has reported treatment by potassium sulphocyanate of 35 well controlled patients, most of them showing the effects of continued arterial hypertension "This drug when used in sufficient dosage caused a definite and marked lowering of the arterial blood pressure in 31 per cent of the patients" Sometimes toxic effects occurred, such as skin rashes, gastro-intestinal symptoms, and nervous excitement. Palmer states, however, that "toxic effects are reduced to a minimum by carefully controlled dosage" He believes that the drug may be of value in conjunction with a general régime of rest and diet

Stieglitz believes that the long-continued administration of bismuth subnitrate has a favorable effect in spastic hypertonia and in angina pectoris The dosage used is 30 grains a day or less

- Blackford J. M. and Wilkinson J. N. Hypertension study of two hundred two cases followed for an average period of ten years with remarks on causes and treatment *Ann Int Med* 1: 64 1932
- Elberg A. and Skulskiy N. A. Clinical aspect of thiocyanate therapy in the treatment of hypertension *Jurnal Medich Tsikly Kiev* 2: 213 1932
- Goldring W. and Chasis H. Thiocyanate therapy in hypertension II. Its effect on blood pressure *Arch Int Med* 49: 934 1932
- Murphy F. D. Grill J. Pessin B. and Moxon G. Essential (primary) hypertension A clinical and morphological study of 376 cases *Ann Int Med* 6: 31 1932
- Palmer R. S. The hypotensive action of potassium sulphocyanate in hypertension *Am J Med Sc* 184: 473 1932
- Stieglitz E. J. Prognostication in hypertensive arterial disease *Illinois M J* 62: 414 1932
- Stieglitz E. J. Therapeutic results with bismuth subnitrate in hypertensive arterial disease *J Pharmacol & Exper Therap* 46: 343 1932
- Wiggers C. J. Physical and physiological aspects of arteriosclerosis and hypertension. *Ann Int Med* 6: 1 1932

The Cor Pulmonale—Achard has reported 3 cases of so called Ayerza's disease—the "black cardiacs", in which the pulmonary lesions resulting in the extreme cyanosis were the effect of poison gas inhalation during the World War Not one of these cases was syphilitic Achard also points out the fact that this condition was known many years before Ayerza appended the new designation, "*cardiacos negros*"

Achard, C. La Maladie des Cardiaques Noirs et ses Rapports avec l'Intoxication par les Gaz. *Libman Anniversary Volumes* P 39 1932

Coronary Disease—Condorelli has published a small volume reviewing the anatomy, physiology, experimental pathology, and clinical as-

diphtheria and scarlet fever, common and serious in the former, and rare and slight in the latter. He writes that in diphtheria, "prevention of the heart injury is entirely feasible. In over 700 cases of diphtheria occurring under observation in the hospital among the employees, no fatality has occurred in the last thirty-five years. No case of cardiac damage has appeared in patients receiving antitoxin treatment during the first twenty-four hours and only rarely when antitoxin was used during the second twenty-four hours."

Jones and Newsom have shown that the hearts of dogs, in which dental abscesses were produced experimentally, constantly suffered small vegetative or verrucose lesions on mitral or aortic valves or on both, as well as parenchymatous changes in the myocardium.

Jones N W and Newsom S J. Experimentally produced focal (dental) infection in relation to cardiac structure. Arch Path 13 392 1932.
Place E H. Heart in diphtheria and scarlet fever. New Eng J Med. 107 864 1932.

The Heart in Thyroid Disease *Thyrotoxicosis*—Anderson has reported a study of 426 patients with auricular fibrillation in thyrotoxicosis, an incidence of 6 to 9 per cent. Quinidine was successful in restoring normal rhythm following thyroidectomy in 90 to 96 per cent of the cases.

Barker, Bohning and Wilson have published a study of 108 cases of auricular fibrillation in Graves' disease, an incidence of approximately 15 per cent. The average age of the patients studied was 51.5 years and the average basal metabolic rate before treatment plus 48 per cent. The arrhythmia is likely to be transient. Digitalis is less effective than with other etiological factors behind the auricular fibrillation and the tolerance to the drug is greater (134 per cent of the theoretical normal). Normal rhythm is restored by operation, with or without quinidine therapy afterwards in 90 per cent of the cases. The average weight of the hearts of 13 patients coming to autopsy was 438 grams (the two heaviest hearts weighed 530 grams each).

Kepler and Barnes have found enlargement of the heart (increased weight) in 49 per cent of 89 fatal cases of hyperthyroidism. Severe congestive failure occurred in 27 out of 178 fatal cases of hyperthyroidism, to be attributed to that factor alone in 9.

Lev and Hamburger have reported 3 new cases of angina pectoris and hyperthyroidism relieved of their heart pain following the administration of iodine and thyroidectomy.

Markowitz and Yater have found that fragments of heart muscle removed from two-day chick embryos, before the appearance of nerve elements, react vigorously to thyroxine with progressively greater increase in rate of pulsation, leading sometimes to fibrillation and paralysis.

Weller and his associates have made a morpho-

logical study of the hearts of 35 patients with exophthalmic goiter and found, with few exceptions, "no gross or microscopical changes not equally represented in a carefully matched control series. The exceptions found were (1) a relatively higher incidence of myocardial fibrosis (80 per cent compared to 51.5 per cent in the control series), endocardial sclerosis, and cellular infiltrations in the series with exophthalmic goiter, and (2) one case in the series of 35 which showed an active focal myocarditis for which no etiological factor could be ascertained other than the hyperthyroid state."

Anderson J P. The incidence of auricular fibrillation (in thyrotoxicosis) and results of quinidine therapy. Am Heart J 8 123 1932.
Barker P S, Bohning A L and Wilson F N. Auricular fibrillation in Graves disease. Am Heart J 8 121 1933.
Kepler E J and Barnes A R. Congestive heart failure and hypertrophy in hyperthyroidism. A clinical and pathological study of 178 fatal cases. Am Heart J 8 102 1932.
Lev M W and Hamburger W W. Studies in thyroid heart disease. Angina pectoris and hyperthyroidism. Am Heart J 8 109 1932.
Markowitz C and Yater W M. Response of explanted cardiac muscle to thyroxine. Am J Physiol 100 16 1933.
Weller C V, Wanstrom R C, Gordon H and Bugher J C. Cardiac histopathology in thyroid disease. Preliminary report. Am Heart J 8 8 1932.

Myxedema—Fahr has reported a study of 17 cases of myxedema. Seventy-five per cent showed signs and symptoms of heart failure in varying degree, 30 per cent severely. The volume of the heart in the severe cases was increased approximately 100 per cent. "The age of onset of myxedema heart varied between nine and seventy years of age. The average age was forty-five at onset."

Fahr G. Myxedema heart. A report based upon a study of 17 cases of myxedema. Am Heart J 8 91 1932.

The Heart in Hypertension—Blackford and Wilkinson have concluded from a ten year study of 202 cases of hypertension, that "hypertension is twice as frequently found in women as in men," that "the mortality rate after ten years is twice greater in men," that "hypertension results from a constitutional hypertonicity of the autonomic neurovascular control in the large majority of instances and is a compensatory angiospasm in the others," that "treatment of uncomplicated hypertension is a matter of mental and physical hygiene rather than of drugs," that "treatment of late results of hypertension requires skillful use of medical and physical measures, added to psychotherapeutic measures," and that "the physician who is a good and cheerful psychologist will be the most successful in relieving the symptoms of hypertensive cardiovascular disease."

Murphy, Grill, Pessin, and Moxon have reported the study clinically and morphologically of 375 cases of essential (primary) hypertension which came to postmortem examination. They conclude that "unifying features of all stages are hypertension, cardiac hypertrophy,

obtained at any time during the first ten days "

Lisa and Ring have reported finding 100 cases of myocardial infarction or gross fibrosis among 942 necropsies performed at the City Hospital in New York from Jan 3, 1928 to May 1, 1931. Thirty-two of the 100 cases showed definite recent scarring. Eighty-three were males, 17 were females. The average age was sixty-one years, the youngest twenty-eight, the oldest eighty-three. The average heart weight was 519 grams, the smallest heart of 200 grams was atrophied, the largest weighed 925 grams. The left ventricle and interventricular septum were affected in the great majority of cases. Of 90 of the cases, 75 (83 per cent) showed moderate to marked sclerosis, 8 slight sclerosis, and 7 no sclerosis of the coronary vessels. Coronary thrombosis was noted in 24 cases. Hypertension occurred in 60 per cent of the cases. Eleven died of angina pectoris and 12 of acute dyspnea.

Parkinson has published an excellent paper on coronary pain with a discussion of coronary thrombosis and of angina pectoris. He emphasizes the great variability of the seriousness of both conditions and refers to the over stressing of their dangers in the past.

Wolferth and Wood have reported 2 cases "to illustrate the use of Lead IV (an anteroposterior chest lead) in the electrocardiographic diagnosis of coronary occlusion. In Case 1, the three conventional electrocardiographic leads yielded little or no diagnostic information except on the fourth day. Nevertheless, for 8 days after the original infarction Lead IV showed striking and unmistakable deviation of the S-T interval from the isoelectric line. In Case 2, both Leads I and IV showed evidence of coronary occlusion. Lead IV showed a much more striking S-T interval deviation than was seen in Lead I.

"In a series of 33 controls deviation of the S-T interval from the isoelectric line was not seen."

Thus it is seen "that certain of the areas of the myocardium which are 'silent' in the three conventional leads have a definite effect on Lead IV."

Barnes A. R. and Ball R. G. Incidence and situation of myocardial infarction in one thousand consecutive post mortem examinations. *Am. J. M. Sc.* 183 215 1932.

Bartels E. C. and Smith H. L. Gross cardiac hypertrophy in myocardial infarction. *Am. J. M. Sc.* 184 452 1932.

Cataldi G. Sull'occlusione lenta delle arterie coronarie. (Con tributo clinico ed anatomo-patologico). *Policlinico* 1932 (Ser. Med.) 39 152 1932.

Crawford J. H., Roberts G. H., Abramson, D. I. and Cardwell J. C. Localization of experimental ventricular myocardial lesions by the electrocardiogram. *Am. Heart J.* 7 627 1932.

Davis N. S. III. Coronary thrombosis without pain its incidence and pathology. *J. A. M. A.* 98 1806 1932.

Holland C. W. and Levine S. A. Limitations of the electrocardiogram as an aid in the diagnosis of coronary occlusion. *New Eng. J. Med.* 207 545 1932.

Lisa J. R. and Ring A. Myocardial infarction or gross fibrosis: analysis of one hundred necropsies. *Arch. Int. Med.* 50 131 1932.

Parkinson J. Coronary thrombosis. *Brit. Med. J.* 2 549 1932.

Wolferth C. C. and Wood F. C. The electrocardiographic diagnosis of coronary occlusion by the use of chest leads. *Am. J. M. Sc.* 183 20 1932.

Miscellaneous Etiological Factors and Relationships *Trauma*—Two cases of nonfatal stab wounds of the ventricles of the heart (Negroes) with clinical and electrocardiographic studies have been reported by Porter and Bigger who found coronary T waves in the electrocardiograms of both cases but no coronary pain. They believe that the actual severance of the muscle fibers which prevented normal contraction of this area of the myocardium accounts for the absence of pain which they assume to be due ordinarily to metabolites accumulating in muscle actively contracting but insufficiently supplied with blood.

Porter W. B. and Bigger I. A. Nonfatal stab wounds of the ventricles with electrocardiographic signs of coronary thrombosis and absence of angina pain. *Am. J. M. Sc.* 184 799 1932.

Pregnancy—Carr and Palmer have found "that there is a definite progressive tendency toward left axis deviation in the electrocardiogram from the second to the sixth month (of pregnancy), while the axis remains about the same in the seventh and eighth months, definitely shifting back to the right in the ninth month." They further found that total inversion of Lead III in pregnancy was of no significance (it occurred in 29 of 264 instances).

Stander and Cadden have found that the cardiac output in normal pregnancy begins to rise above the normal level at the start of the fourth month and increases steadily until it is 50 per cent of the normal nonpregnant level at full term returning to its original level by the end of the third week of the puerperium.

Carr F. B. and Palmer R. S. Observations on electrocardiography in heart disease associated with pregnancy with especial reference to axis deviation. *Am. Heart J.* 8 238 1932.

Stander H. J. and Cadden J. F. Cardiac output in pregnant women. *Am. J. Obst. and Gynec.* 24 13 1932.

The Heart in Obesity—Prodger and Dennig, after comparing various aspects of the circulation in 3 obese but otherwise healthy individuals (2 men and 1 woman) with the same aspects in 4 normal controls, have concluded that "the symptoms which are so commonly associated with cardiac insufficiency and which are frequently observed in cases of simple obesity are not due to an inefficient circulatory response, but rather to mechanical and chemical disturbances associated with obesity."

Prodger S. H. and Dennig H. A study of the circulation in obesity. *J. Clin. Investigation.* 11 789 1932.

Athletics and the Heart—Brooks has published a review of the so called "athlete's heart." He finds that the cases formerly classed as the athlete's heart represent primary disease with subsequent relative over stress. Hypertrophy of the heart, such as may occur within physiological limits is so slight as to be undetectable by

pects of the coronary circulation This is a useful summary of data collected by many workers who are listed in a fairly complete bibliography

Hochrein has written a comprehensive and valuable survey of the physiology and diseases of the coronary circulation in the form of a monograph of 227 pages The anatomy and results of physiological and pharmacological experiments make up the first half of the book, while the second half takes up the pathological physiology, pathological anatomy, symptoms, signs, and treatment of coronary disease with especial reference to angina pectoris and coronary thrombosis An extensive bibliography is appended

Boas and Donner have made an analysis "of 615 males and females of the industrial class in New York City who were referred with the presumptive diagnosis of heart disease (The patients were all Jews) Eighty-eight per cent of the population from which the patients were drawn were under the age of fifty Almost one-third of the 615 referred patients had disease of the coronary arteries Of those with disease of the coronary artery, 71 per cent were under the age of 51 This represents an exceptionally high frequency of coronary artery disease, which is all the more remarkable in view of the preponderance of individuals under the age of fifty " "Our data," the authors say, "demonstrate that coronary artery disease, contrary to general belief, is more common, and occurs earlier in life, at least in certain groups of industrial workers" (of the Jewish race, should be added) They suggest the desirability of further studies along similar lines with different racial and occupational groups

Condorelli L Die Ernährung des Herzens und die Folgen ihrer Störung Theodor Steinkopff Dresden and Leipzig 1932 230 pages

Boas E P and Donner S Coronary artery disease in the working classes J A. M. A. 98 2186 1932

Hochrein, M. Der Coronarkreislauf Physiologie Pathologie Therapie 227 pages 54 illustrations Julius Springer Berlin 1932

I *Coronary occlusion* — Barnes and Ball have reported their finding of gross myocardial infarction in 49 out of 1,000 unselected consecutive postmortem examinations In 25 cases, the infarct was located in the anterior and apical portion of the left ventricle (supplied by the anterior descending branch of the left coronary artery), in 21 cases the infarct involved the posterior basal portion of the left ventricle (supplied generally by the right coronary artery), and in 3 cases both areas were affected

Bartels and Smith have made a study "of the weights of the heart in 42 cases of cardiac infarction, in which all other known or supposed causes of cardiac hypertrophy have been excluded. Of the 42 cases, in 37 (88 per cent) there was definite gross cardiac hypertrophy In 5 cases, the weights of the hearts were not

above normal The minimal increase in weight was 18 grams (9 per cent), the maximal increase, 341 grams (108 per cent), and the average increase, 132 grams (44 per cent) From the data given it would appear that cardiac infarction is a definite cause of cardiac hypertrophy "

Cataldi has reported the case of a man thirty-nine years old who died of heart failure and showed at postmortem examination intense luetic aortitis with complete occlusion of the right coronary artery at its mouth, aortic valve regurgitation, enormous hypertrophy of the left ventricle, and ventricular myocardial lesions, especially on the left side There were macroscopic anastomoses between the left and right coronary arteries

Crawford and his associates have studied electrocardiographic changes "in relation to the site of damage in thirty-four cats in which localized ventricular myocardial lesions had been produced by the electric cautery Monophasic type curves were obtained which were classified as of the T₁ and T₃ types of Parkinson and Bedford With almost complete consistency, lesions in similar sites produced the same type of curve Lesions on the anterior surface of the left ventricle produced curves of the T₁ type, while those on the posterior surface of the left ventricle, including the apex, yielded the T₃ type All right ventricular sites, except the base anterior in which only a slight change was induced, gave curves of the T₃ type In a few instances an R-T elevation was present in all three leads but as a rule to a greater extent in one lead In three experiments, in each of which the lesion was located at the base anterior, depression rather than elevation of the R-T segment occurred "

Davis has reported that in a series of 76 cases of coronary thrombosis proved at postmortem examination in Chicago, only 36 (47 per cent) gave a history of pain, 29 (38 per cent) gave no history of pain, and 11 (15 per cent) were without history (sudden deaths)

Holland and Levine have reported that "in a study of 328 cases of coronary occlusion in which electrocardiograms were taken, there were 35 that showed essentially normal tracings at one time or another following the onset of attack.

"In 6 cases, so-called normal electrocardiograms were obtained from a few hours to seven days after the onset of attack In all these, subsequent tracings showed characteristic alterations in the ventricular complexes In 20 cases typical changes in the tracings taken soon after the onset of the attack were replaced by 'normal' curves at some subsequent time In 9 cases the only electrocardiograms obtained were normal In only 1 of these 9 cases were curves obtained within the first ten days Of the entire series of 328 cases there were only 8 in which 'normal' electrocardiograms were

the patients had aortic incompetence and mitral stenosis. One had both with aortic stenosis as well, 1 had aortic stenosis and incompetence, and 1 had aortic incompetence alone. When there was no mitral disease there were 2 men for each woman, when there was mitral disease there were 2 men for every 3 women. They came under first observation at all ages, least commonly before ten or after fifty. There was so little difference between the ages of those with and those without aortic stenosis that its presence must depend on the severity and nature of the attack rather than on the length of time that had elapsed. Pure aortic stenosis was rarely found, and, so far as could be judged from the pulse pressure, the stenosis was relatively unimportant compared with the regurgitation, even when the signs were well marked. Among the syphilitic cases there were 3 men for each woman, nearly four-fifths being between forty and sixty years of age, aortic stenosis was rarely or never present, and the average pulse pressure was much greater than in the rheumatic cases (110 instead of 70). Nearly all the atheromatous cases were men, between fifty and eighty years of age, aortic stenosis was more important and more frequently present, the signs of regurgitation being often absent. Auricular fibrillation was present in 30 per cent of those who also had mitral stenosis in 8 per cent of the rheumatic cases without mitral stenosis, and only rarely in the nonrheumatic group. Left ventricular preponderance was found in about half the electrocardiograms of those with pure aortic disease, normal limits being found in the remainder. The T waves were inverted, most often in lead I, in about one-fourth of the rheumatic cases and in about half of the others. The prognosis was enormously better in the rheumatic group, the average duration of life after the development of aortic incompetence was probably twenty years, excluding those who died quickly from active rheumatic carditis. In the syphilitic group, on the other hand, it was not much more than two years after the development of symptoms, few patients living for eight years.

Campbell M. and Shackleton J. W. Note on aortic valvular disease with reference to etiology and prognosis. *Brit. M. J.* 1 328 1952

Pericardial disease—Smith and Willius have published a study of pericarditis based on 373 cases found among 8,912 necropsies at the Mayo Clinic, an incidence of 4.2 per cent. Adherent pericarditis was present in 144, or 38.4 per cent, of these 373 cases, 100 times in the male as compared with 44 times in the female sex. These patients ranged in age from two to eighty-five years. Rheumatic fever was apparently the etiological factor in 21.5 per cent, pulmonary and pleural diseases were next in frequency (17.4 per cent). Cardiac infarction was present in 6.2 per cent, neoplasm in 2.8 per cent. Only

3 cases were noted to be tuberculous. The pericardial sac was completely obliterated in 53 cases (36.8 per cent). Calcification of the pericardium was found in 15 cases (10.4 per cent). The heart weights varied greatly. Associated cardiac disease was present in only about half the cases (53.5 per cent (most commonly coronary disease) and in only 39.5 per cent were there any important cardiac symptoms or signs, due chiefly to mitral stenosis. Thus frequently asymptomatic and unimportant adherent pericarditis exists. In 87 cases of this group it was a mere incident complicating all sorts of conditions.

These authors next consider calcification of the pericardium which they found in 15 cases at necropsy, in none of these cases had the diagnosis been made during life. All 15 had extensive chronic adhesive pericarditis. Twelve were males and 3 females. The age range was from twenty-four to eighty-four years. Six cases had had rheumatic fever. Mitral stenosis was present in 3 of the cases. In 10 of the 15 cases failure of the heart was the primary cause of death.

Pericardial effusion was found by Smith and Willius in 113 cases, or 30 per cent, of all the cases of pericarditis which came to autopsy at the Mayo Clinic. Sixty-nine per cent were males and 31 per cent females. The range in age was from eight months to eighty-nine years. Acute purulent pericarditis was the most common type (68.1 per cent), fibrinous pericarditis in this series occurred in only 3 cases (2.7 per cent), while noninflammatory effusion was present also in 3 cases. The effusion varied in amount from 25 cc to 1,500 cc. Pleural effusion was present in 73.5 per cent of the cases. Only 33 cases, or 29.2 per cent of the 113 with effusions in the pericardial sac had any associated cardiac disease, and only 13.2 per cent had any important cardiovascular symptoms.

These authors have reported findings at necropsy at the Mayo Clinic. Fibrinous pericarditis without effusion in 62 of 373 cases of pericarditis (16.6 per cent), the ratio of sex in this series of 62 cases was 69 per cent male to 31 per cent female. All ages were represented from four to seventy-four years. "Associated cardiac disease occurred in thirty-one cases (50 per cent). Only 20 of the 62 had any cardiovascular symptoms of importance." The condition may be innocuous in itself or it may be prodromal to more serious forms of pericarditis, with effusion, purulent or adherent. Intrathoracic infection (of lung or pleura) was apparently the cause in most of the cases (53.2 per cent). Primary pericarditis of indeterminate origin occurred next in frequency (19.4 per cent). Rheumatic fever was the cause in 14.5 per cent while infection elsewhere in the body was found in 12.9 per cent.

There were also found 15 cases with milk

our present methods of clinical study. Prevention of cardiac hypertrophy of pathological degree relies on the early recognition of cardiac disease and on the subsequent individual limitation of physical stress."

Steinhaus and his associates have measured bi-weekly roentgenographic records of the cardiac silhouette of 12 male dogs from 4 litters for area, greatest length, breadth, and transverse dimension. They have concluded from such studies that strenuous exercise (running and swimming) leads to an enlargement of the heart of growing dogs, this enlargement appears within three to five weeks from the beginning of exercise. "There are indications pointing to regression of the heart size when exercise is discontinued." There was little change of importance in the electrocardiograms of these exercised dogs. The trained dog tended to have a slower pulse and more respiratory arrhythmia than did the untrained dog.

Brooks H. The Heart of the Athlete. Libman Anniversary Volume. P 227 1932

Steinhaus A. H. and associates. Studies in physiology of exercise. VIII. Chronic effects of running and swimming on hearts of growing dogs as revealed by roentgenography. IX. As determined electrocardiographically. Am J Physiol 99 503 1932

The Heart in Old Age—Willius and Smith have found that only 48, or 12.6 per cent, of 381 persons who lived to be seventy years old or more died of heart disease.

Willius F. A. and Smith H. L. Further observations on the heart in old age. A postmortem study of 381 patients aged seventy years or more. Am Heart J 8 170 1932

Neuroses and Neurocirculatory Asthenia—Crile has reported relief of symptoms of neurocirculatory asthenia in most of the cases with this condition in which he has denervated the adrenal glands. Of 21 patients operated on with bilateral denervation in the past eighteen months, 18 have been much improved, another case has been well for four and one-half years after unilateral denervation and one other patient has been relieved of symptoms for fourteen years since a unilateral suprarenalectomy.

Crile G. W. Denervation of adrenal glands for neurocirculatory asthenia. technic and clinical results. Surg Gynec. & Obst 64 794 1932

PATHOLOGY

Myocardial disease—Freeman and Griffin have reviewed the cases on record of spontaneous rupture of the heart and have found rupture of the right auricle in 35 cases, of the left auricle in 12 cases, of the right ventricle in 63 cases, of the left ventricle in 493 cases, and miscellaneous in 15 cases (mostly papillary muscles). They have reported 2 new cases, one a male aged sixty years, and the other a female aged seventy.

Ham has shown that "enormous single doses of irradiated ergosterol will produce massive

calcification in the aorta, coronary vessels and cardiac musculature of the rat as soon as forty-eight hours after administration. Sections from the tissues twenty-four hours after administration show nothing that would presage such an imminent catastrophe so that the calcifications do not appear to depend on degenerative changes in the recipient tissues. On the other hand, the rapidity of formation, together with the massiveness of the calcifications, suggests very strongly that the prime factor in their causation is the inability of the serum to retain all its calcium in solution. It is suggested that precipitation depends on saturation of the serum with diffusible calcium plus other factors"—such as change in carbon dioxide tension and addition of other ions which would force a precipitation of calcium salts. "A marked inflammatory cell infiltration developed about the affected coronary vessels and about the calcified areas of cardiac muscle."

Freeman W. and Griffin E. D. Cardiac rupture with perforation of interventricular septum. Report of two cases. Am Heart J 7 732 1932

Ham A. W. Mechanism of calcification in the heart and aorta in hypervitaminosis D. Arch Path 14 613 1932

Endocardial Disease—Amitschkow has published an important paper on studies he has made of atherosclerosis (lipoidosis) of the heart valves and its relation to endocarditis in 40 hearts with valvular disease due to atherosclerosis, endocarditis, or both. He concludes that "pure (primary) atherosclerosis (or rather lipoidosis, consists of a deposit of lipid substances and a formation of atheromatous foci, it leads neither to the development of cicatricial tissue, nor to deformation and ulceration of the valves and, therefore, has no great independent importance in the origin of heart valvular defects. Lipoid deposition added to endocarditis in various stages of its development, presents in acute cases a picture of these two combined processes. The secondary lipoidosis (atherosclerosis) of cicatricially changed heart valves reaches a particularly high degree of development. The so called atherosclerotic defects of the heart valves have as their basis only the atheromatous transformation of the cicatricial tissue of the valves left as a result of endocarditis. Such secondary atherosclerosis, i. e., atheromatosis of the heart valves, can considerably aggravate the principal picture of a valvular defect which has arisen on the basis of a cicatricial endocarditis."

Amitschkow N. Atherosclerosis (lipoidosis) of the heart valves and its relation to endocarditis. Libman Anniversary Volume. P 651 1932

Aortic Valve Lesions—Campbell and Shackle have reported that in a series of cases with disease of the aortic valves, the condition was due to rheumatism in 200, to syphilis in 55, to atheroma in 20, and to all other causes in 21 cases. Out of every 6 rheumatic cases, roughly, 3 of

syphilis" The 5 cases were aged twenty-three, forty-five, fifty-four, thirty-nine, and thirty-eight years old respectively There were 3 females and 2 males in the series

Wood, Pendergrass, and Ostrum have reviewed the subject of dissecting aortic aneurysm with especial reference to its roentgenographic features They report 11 new cases, 5 of their own and 6 from the literature to add to the group of about 400 previous cases reported Of this earlier group only 6 had been correctly diagnosed clinically, there is no note that any were so diagnosed in the later group

Klotz, O and Simpson W Spontaneous rupture of the aorta. Am. J. M. Sc. 184 455 1932
Wood F C, Pendergrass E P and Ostrum H W Dissecting aneurysm of aorta with special reference to its roentgenographic features Am J Roentgenol. 25 437 1932

Pulmonary Arterial Disease—Gibbon, Hopkinson, and Churchill have determined that obstruction of the pulmonary artery up to 60 per cent of its cross sectional area in cats is without significant effect upon either the arterial or the venous pressure When the occlusion lies between 60 and 85 per cent there is a fall in blood pressure and a rise in venous pressure "The circulation fails not primarily from cardiac insufficiency but due to the fact that blood collects on the venous side of the system by reason of the obstruction to the outflow from the right heart The obstruction is fatal when 85 to 100 per cent of the pulmonary artery is occluded"

Gibbon, J H Jr Hopkinson, M and Churchill E D Changes in the circulation produced by gradual occlusion of the pulmonary artery J Clin Investigation 11 543 1932

General Arterial Disease—Waters has discussed the treatment of peripheral vascular diseases with acetylcholine hydrochloride (50 to 100 mg subcutaneously or intramuscularly, to be repeated at twelve to twenty-four hour intervals, administered orally, it is ineffective and when given intravenously, it is very toxic and may kill) He reports healing of gangrenous areas, relief of pain, and elevation of surface temperature in 3 patients with trophic lesions due to vascular disease of the extremities This drug has the advantage over typhoid vaccine in that there are no constitutional reactions following its use

Winkelman and Eckel have written that lesions of the spinal cord can result from vascular disease, such as arteriosclerosis, thrombosis, rupture, or emboli The lesions may be small and scattered or may involve a complete transverse level The scattered small lesions may resemble multiple sclerosis The transverse softening may resemble a compression syndrome Syphilis plays an important rôle in vascular disease Unusual conditions, such as

angioma and carcinoma, must be kept in mind in the diagnosis of lesions of the spinal cord.

Waters W C Jr Peripheral vascular diseases Treatment with acetylcholine hydrochloride Ann. Int. Med. 5 1267 1932

Winkelman, W and Eckel J L Focal Lesions of the Spinal Cord Due to Vascular Disease J A. M. A 99 1919 1932

Diseases of the Veins—Homans has published a good review of the subject of thrombophlebitis In summary he has said, "There are forms of thrombophlebitis dependent upon an unhealthy state of the vein's wall, the varicose type, and peculiar sorts, partly of local origin and partly due, perhaps, to an abnormality of the blood—phlebitis migrans There are also venous thromboses of traumatic origin But thrombophlebitis which affects the previously healthy veins draining the lower limbs, particularly the familiar scourge, phlegmasia alba dolens, appears to be secondary to a nonsuppurative lymphangitis, which from its situation, is able to attack artery as well as vein And the principal exhibitions of such a disease are neither venous nor arterial, but lymphatic"

Moscowitz has described for the first time sclerosis of the hepatic veins associated with hypertension of the pulmonary circuit He cites 3 cases all discovered within a few weeks, and believes the lesion to be very common He states that "sclerosis of the hepatic veins is only present when a condition causing increased pressure in the hepatic veins can be predicated, the result in every instance of hypertension of the pulmonary circuit with right heart failure It is always associated with passive venous congestion of the liver with and without cardiac cirrhosis The lesion consists in dilatation of the hepatic veins with thickening of both intima and media and proliferation of the elastic fibres, and is interpreted as compensatory to the increased intravenous pressure"

Homans J Phlegmasia alba dolens and the relation of the lymphatics to thrombophlebitis Am Heart J 7 415 1932

Moscowitz, E. Phlebosclerosis of the Hepatic Veins Libman Anniversary Volumes 2 857 1932

Aneurysms

AORTIC—Aschner has reported a case of gonococcus mycotic aneurysms of the ascending aorta, four in number, in a woman twenty-three years old He concludes with a review of the literature on mycotic aneurysms

White has reported successful relief of pain caused by aneurysms of the aortic arch in 3 cases by paravertebral injections of alcohol (2 cases) and procaine alone (1 case) He writes "Procaine injection is of diagnostic value in determining which communicant rami transmit the painful impulses to the spinal cord It may give relief over prolonged periods Alcohol, when accurately injected, causes permanent destruction of the sympathetic rami Sympathetic

spots or "soldier's patches," believed to represent relics of localized nonobliterating pericarditis, 11 of these cases were males and 4 were females

These authors have further reported the finding of 40 cases of terminal pericarditis among 373 cases of pericarditis coming to necropsy at the Mayo Clinic, an incidence of 10.7 per cent. Of these 40 patients, 28 were males and 12 females. The age limits were fifteen and eighty-three years. Heart disease was often associated, but the heart was predominantly a factor in the clinical syndrome in only 4 cases. Coronary disease occurred in only 3 cases and rheumatic heart disease also in only 3. Bacterial endocarditis was present in one case. The major diagnosis in 32.5 per cent was carcinoma and in 25 per cent nephritis (with uremia). Infections occurred in only half the cases.

Camp and White have presented clinical and pathologic data on 126 cases containing over 100 cc of pericardial fluid found at postmortem examination at the Massachusetts General Hospital over a period of ten years (1921 to 1930 inclusive), similar data on two cases at the Massachusetts Eye and Ear Infirmary, and clinical data on 15 other cases in which pericardial paracentesis established the diagnosis of pericardial effusion. "The predominant etiologic factor in the cases with pericarditis was infection of some type (uremia was a rare cause). In cases without pericarditis the predominant etiologic factor was chronic passive congestion or infection elsewhere in the body."

Pain was present in 24 of the 126 cases of the postmortem series of the Massachusetts General Hospital, dyspnea in 68, orthopnea in 37, distended cervical veins were noted in 5, pericardial friction rub in 8, distant heart sounds in 29, and the pulsus paradoxus in 1 case. Forty-nine cases were examined by roentgen ray. A correct diagnosis was made once and questioned in 3 other cases. Allowances must be made because many of these cases were examined at least several days before death and often in a very ill condition, with pleural fluid sometimes obscuring a part of the heart shadow. Of the 126 cases of the postmortem series at the Massachusetts General Hospital a correct clinical diagnosis was made only six times, in 4 of the 94 cases with between 100 and 250 cc of pericardial fluid, in none of the 24 cases with 250 to 500 cc of fluid, and in 2 of the 8 cases with over 500 cc of fluid. "The clinical group of 15 other cases in whom a pericardial paracentesis established the diagnosis of pericardial effusion was most instructive since it was made up of patients who presented the classical signs of effusion in a much greater degree than did the 'postmortem' cases." All but one of these clinical cases undoubtedly had over 500 cc of fluid

in the pericardium, the one who had considerably less showed at operation a much thickened contracted parietal pericardium. The authors conclude that "without the presence of an acute fibrinous pericarditis, the diagnosis of pericardial fluid is likely to be missed unless the effusion amounts to over 500 cc."

Foulger and Foulger have reported experiments on dogs showing that a fall in arterial blood pressure accompanies an increase in intra-pericardial pressure, as does also decreased voltage of the QRS wave of the electrocardiogram with inversion of the T wave which may finally resemble a coronary T wave. "An intrapericardial pressure of 3 to 8 mm Hg is sufficient to produce an obviously negative T-wave" in these experimental animals.

Sprague, Burch and White have reported a study of the autopsy material at the Massachusetts General Hospital from 1921 to 1931 for cases of adherent pericardium (43 cases, or 2.26 per cent of 1900 cases) and from 1893 to 1931 for cases of Pick's disease or mediastinopericarditic pseudocirrhosis of the liver (only 3 cases in this period of 38 years). No case of rheumatic pericarditis either in the Massachusetts General Hospital series or in a clinical group of 62 patients at the House of the Good Samaritan has ever developed Pick's disease. The authors conclude that it is unjustifiable to recommend pericardial resection following acute rheumatic pericarditis to prevent later effects of adhesions, also that tuberculosis of an insidious type is the most probable cause of the majority of cases of Pick's disease, and that, in middle and old age, adhesive pericarditis with or without calcification is an unimportant cause of symptoms and death except in very rare instances.

- Camp P D and White P D. Pericardial effusion a clinical study. *Am J M Sc.* 184 782 1932.
Foulger M and Foulger J H. The blood pressure and electrocardiogram in experimental pericardial effusion. *Am. Heart J.* 7 744 1932.
Smith H L, and Willis F A. Pericarditis I. Chronic adherent pericarditis II. Calcification of pericardium III. Pericarditis with effusion. *Arch Int Med.* 50 171 184 192 1932.
IV. Fibrinous pericarditis and soldier's patches. *Arch Int Med.* 50 410 1932.
V. Terminal pericarditis. *Arch Int Med.* 50 415 1932.
Sprague H B, Burch H A, and White P D. Adherent pericardium and Pick's syndrome. An autopsy study. *New Eng J Med.* 207 483 1932.

Vascular Disease (Including Lesions of Aorta and Pulmonary Artery)

Aortic Pathology—Klotz and Simpson have studied 5 cases of so called spontaneous rupture of the aorta. "A common underlying process was demonstrated in all cases, consisting of a peculiar noninflammatory degeneration of the media, affecting the muscle and elastic fibers, due to a variety of factors. Similar lesions precede the development of dissecting aneurysms. The lesions have no relation to

increases cardiac size and increases the extent of ventricular contraction. The consequence of these actions is that the volume of the cardiac output which results differs depending on an initial difference in size of the ventricular cavities, in the two situations. In the one, the normal heart, it becomes too small in the other the diseased heart it develops a suitable size."

Cohn, A. E., and Steele, J. M. Studies on the effect of the action of digitalis on the output of blood from the heart. I. The effect on the output of the dog's heart in heart lung preparations. *J. Clin. Investigation*. 11 871 1932

Stewart, H. J. and Cohn, A. E. Studies on the effect of the action of digitalis on the output of blood from the heart. II. The effect on the output of the hearts of dogs subject to artificial auricular fibrillation. *J. Clin. Investigation*. 11 987 1932

Studies on the effect of the action of digitalis on the output of blood from the heart. III. Part 1. The effect on the output in normal human hearts. Part 2. The effect on the output of hearts in heart failure with congestion in human beings. *J. Clin. Investigation*. 11 917 1932

Diuretics—Herrmann and his associates have made careful studies of the action of diuretic drugs on 12 cases of congestive heart failure with edema, using particularly among other tests the creatinine method of Rehberg, in order to try to determine how these diuretics work. Among their conclusions are the following:

"Rest, digitalis and theophylline-ethylene-diamine (euphylline) apparently result in augmented glomerular tuft and tubular capillary circulation with a consequent increased glomerular filtration and a concomitant slightly impaired or less efficient tubular reabsorption to account for the increased urinary output.

"Mersalyl, or salyrgan, seems to produce diuresis primarily by depressing the cells of the tubular epithelium, thereby hampering diffusion or reabsorption, while filtration is little if at all affected. The defective reabsorption is great enough to account for the diuresis.

"From our studies it appears that the action of diuretics is primarily on the kidney and only secondarily on the tissue fluids."

Miller and Feldman have reported on the prolonged use of massive doses of urea in cardiac dropsy, giving 5 detailed case reports. The doses of urea varied between 10 and 25 grams, two or three times a day in 40 per cent water solution. Whenever possible, at the beginning of treatment, the patients received about 18 grams three times a day (rarely 27 grams three times daily). After satisfactory diuresis the drug was gradually reduced, the patients receiving 15 or even 12 grams three times or twice daily for months to prevent the reaccumulation of edema. As a general rule, the patients took the drug without remonstrance although its taste is very unpleasant. Sometimes the addition of syrups helped. The authors conclude that "urea administered in the way described has been found to be an effective diuretic over long periods of time in selected cases. Whereas it can function alone over many months in keeping the patient edema-free, it may require the supplemental use of other diuretics. This is true for the patient with or without auricular

fibrillation. Cases are reported in which its unbroken administration continued over three years. Urea does not impair the function of the kidneys or alter their histologic structure after prolonged administration. The drug tends to maintain the patient's weight at a low and constant edema-free level over months and even years. During such periods our patients often required little or no restrictions of the intake of fluid or salt within ordinary dietary limits."

Schmitz has conducted experiments on dogs to compare the diuretic action of euphyllin and salyrgan by Rehberg's method. He has found that "during euphyllin diuresis the calculated amount of glomerular filtration is consistently increased while tubular reabsorption shows no constant change. Salyrgan diuresis is characterized," he found on the other hand "by a considerable decrease in the percentage of fluid reabsorbed in the tubules. The amount of filtration is seldom increased significantly."

Tarr and Jacobson have reviewed the comparative toxicity of salyrgan and novasurol and have noted the inconsistency between the clinical findings and the results of animal experimentation. "In more than 3,000 injections of salyrgan given at the Montefiore Hospital only two instances of mild stomatitis were encountered when the drug was administered to patients with impaired renal function. In one patient wrist-drop developed and in two foot-drop following faulty intramuscular injection. Anatomic studies were made of thirty patients with congestive heart failure who were given repeated injections with doses of salyrgan up to 130 cc. In one case a lesion suggestive of mercurialism was found at autopsy in the kidney."

Wiseman has reported the successful use of novasurol and salyrgan in 270 injections over a period of five years in the case of an obese woman with hypertensive cardiovascular disease and congestive failure. "An excellent diuretic response was maintained throughout. The prolonged diuretic treatment appeared to be without harmful effects on the kidneys or other organs."

Stockton has reported his finding that "the intramuscular injection of bismuth sodium tartrate into fifteen patients was followed by a definite and sustained increase in diuresis in 73 per cent." The dose injected was 0.03 gram of the bismuth compound.

Herrmann, G. Stone, C. T. Schwab, E. H. and Bondurant, W. W. Diuretics in patients with congestive heart failure. *J. A. M. A.* 99 1647 1932

Miller, H. R. and Feldman, A. Prolonged use of massive doses of urea in cardiac dropsy. *Arch. Int. Med.* 49 964 1932

Schmitz, H. L. Studies on the action of diuretics. I. The effect of euphyllin and salyrgan upon glomerular filtration and tubular reabsorption. *J. Clin. Investigation*. 11 1075 1932

Stockton, A. B. Bismuth diuretics and blood and urinary changes under clinical conditions. *Arch. Int. Med.* 50 142 1932

Tarr, L. and Jacobson, S. Toxicity of mersalyl (salyrgan) clinical and anatomic study. *Arch. Int. Med.* 50 155 1932

Wiseman, J. R. The prolonged use of salyrgan. *J. A. M. A.* 99 114 1932

ganglionectomy although a surer method of interrupting cardio-aortic pain pathways, is too serious an operative procedure to use in patients with large thoracic aneurysms. Paravertebral block, although technically a difficult procedure, is well tolerated and should give satisfactory results in a large percentage of cases."

Aachner P W Gonococcus aneurisms of the aorta Libman Anniversary Volumes P 75 1932
White J C Painful aneurysms of the aortic arch relief by paravertebral injections of procaine and alcohol J A. M. A. 99 10 1932

ARTERIOVENOUS — Matas, Herrmann and Reid have reported a case showing the effect of an arteriovenous aneurysm on the heart. The aneurysm was femoral and had been present for seventeen years. There were cardiac hypertrophy and dilatation. Excision of the aneurysm relieved completely all cardiac symptoms and caused the heart to return to normal size.

Horton has discussed a study made of 23 cases out of the 24 who were diagnosed congenital arteriovenous fistula at the Mayo Clinic from June 28, 1929, to May 11, 1931. Eleven were males, 12 females. The right arm was involved in 3 cases, the left arm in 5, the right leg in 4, the left leg in 11. In only one case was a correct diagnosis made before entry to the Clinic. Most of the others were diagnosed varicose veins. Cardiac hypertrophy was definite in 8 cases. Hypertension was found in 6 cases, tachycardia (over 80) in 18 cases. The affected limb was hypertrophied in each case.

Horton B T Hemihypertrophy of extremities associated with congenital arteriovenous fistula. J A. M. A. 98 373 1932
Matas R Herrmann G and Reid M R Effect of arteriovenous aneurysms of heart report of case studied Ann. Surg. 96 678 1932

FUNCTIONAL DISORDERS

Congestive Failure, Including the Use of Digitalis and Diuretics

Austrian has reported an interesting case of encapsulated hydrothorax on the right side in association with congestive heart failure in a man fifty-eight years old. Postmortem examination showed syphilitic aortitis, aortic insufficiency, obliteration of the orifice of the right coronary artery, cardiac hypertrophy and dilatation, and pleural adhesions.

Harrison and his associates have studied the mechanism of dyspnea on exertion in cardiac patients and have arrived at the following conclusions: (1) A decrease in vital capacity is important in two respects. (a) *Per se*, it lowers the respiratory reserve and thereby predisposes to dyspnea, (b) It increases the resting ventilation through vagal reflexes from the lungs and hence lowers the respiratory reserve still further. (2) Afferent impulses from the moving muscles play a rôle in the production of dyspnea because they cause reflex increase of the ventilation during the exertion. (3) Reflex stimulation of respiration, because of increased pres-

sure in the right side of the heart and in the cardiac ends of the great veins, is of especial importance. (4) All these factors so operate as to increase the value of the quotient $\frac{\text{ventilation}}{\text{vital capacity}}$, which is a measure of subjective respiratory distress in persons with cardiac disease.

Meakins has written that "There are three important known conditions which may lead to failure of the cardiac muscle to function properly through a defect in cardiac glycogen metabolism. They are oxygen want, thyrotoxicosis, and insulin deficiency."

Austrian C R Encapsulated hydrothorax (hydrothorax sacculus interlobaris) in association with myocardial insufficiency Libman Anniversary Volumes P 101 1932
Harrison T R Harrison W G Calhoun J A and Marsh J P Congestive heart failure XVII. The mechanism of dyspnea on exertion Arch. Int. Med. 50 690 1932
Meakins J C Modern muscle physiology and circulatory failure Ann. Int. Med. 6 506 1932

Digitalis Action—Cohn and Steele have found that "the minute output from failing, dilated hearts in dogs in heart lung preparations is increased when therapeutic doses of digitalis are administered. This effect is the opposite of that in the case of healthy hearts, normal in size. When the output increases, the pressure in the right auricle decreases. Increase in output is consistent with decrease in the diastolic volume of the heart."

Stewart and Cohn have found that in dogs "when the cardiac output is diminished and the heart is dilated due to artificial auricular fibrillation, the administration of digitalis results in increase in cardiac output and decrease in cardiac size." These observers concluded that "digitalis has the same action in normal and in pathological hearts, it decreases cardiac size (an effect on tone). The amount of the cardiac output which results from this action depends upon the initial size of the heart, it decreases in normal hearts, and increases in dilated ones."

Stewart and Cohn have continued their studies of the effect of digitalis on heart size and output, this time in man and have concluded as follows:

"(1) A consequence of the action of digitalis is to decrease the volume output of blood per minute from the heart in normal human beings and to decrease its size. (2) The volume output of blood per minute from the heart which is in failure is diminished and its size larger than when it is in a state of compensation. (3) Following the administration of theocalcin in patients during heart failure, cardiac output increases and cardiac size and venous pressure diminish. (4) Giving digitalis increases the volume output of blood per minute from failing hearts and decreases their size. (5) Digitalis, we think, has similar, perhaps identical, actions both in normal and in diseased hearts, it de-

attack of angina pectoris induced by the abnormal heart rhythm

Nuzum and Elliot have reported the results of their administration intramuscularly of an insulin-free extract of the pancreas to 20 patients with angina pectoris and to 5 with intermittent claudication. This extract is a vasodilator that modifies the pressor effects of epinephrine and dilates the coronary arteries of the rabbit's heart to a degree exceeding that produced by drugs of the purine group. Of the cases of angina pectoris, "two, or 10 per cent, were not helped, five, or 25 per cent were somewhat relieved, eleven, or 55 per cent, were greatly helped, and two who were benefited by treatment died later. Forty-one patients with angina pectoris who received the usual medical treatment and were followed for a like period of time were studied as a control series. In ten instances or 24.3 per cent, no benefit was observed, fourteen patients, or 34.1 per cent, experienced moderate relief, fourteen, or 34.1 per cent, received pronounced benefit, and three, or 7.4 per cent, died." The cases of intermittent claudication were all benefited to a pronounced degree. The extract was given intramuscularly in doses of from 30 to 60 hypotensive units on alternate days or twice weekly, depending on the severity of the symptoms, for a total of from ten to twelve doses. Two or three such courses were given to some of the cases at intervals of a week.

- Katz, L., Hamburger W. W. and Lev M. The diagnostic value of epinephrine in angina pectoris. *Am. Heart J.* 7 371 1932
- Llan, C., and associates. L'Angine de Poitrine. Formes Cliniques. *Traitement Medical et Chirurgical* 425 pages 34 figures. Masson et Cie. Paris 1932
- Nuzum F. R. and Elliot, A. H. Pancreatic extract in treatment of angina pectoris and intermittent claudication. *Arch. Int. Med.* 49 1007 1932
- White P. D. and Camp P. D. The status anginosus induced by paroxysmal auricular fibrillation and paroxysmal tachycardia. *Am. Heart J.* 7 581 1932

Arrhythmias. PREMATURE BEATS AND TACHYCARDIA.—Sampson and Anderson have published an interesting report of the results of their administration of potassium salts orally to 58 patients who were known to have auricular or ventricular ectopic beats or paroxysmal auricular or ventricular tachycardia. "One of the patients received in addition 10 cc of potassium chloride intravenously in a 1 per cent solution without ill effect, but with no demonstrable advantage over the oral route of administration. 'Five' different salts of potassium were used, namely, the chloride, iodide, bromide, citrate, and acetate, all with apparently identical effects when applied to the same patient (Case 3). As a control measure, sodium acetate was given and produced no change in the arrhythmia. The acetate caused less gastric distress than any of the other salts, so this compound was adopted for routine use, in a 25

per cent aqueous solution." The effective dosage varied from 2 to 16 grams. Response occurred in the majority of cases in about forty minutes, ranging from twenty to ninety minutes. The duration of effect ranged from three to eight hours. An effective dose has been found to be 2 to 4 grams every six to eight hours and may be given over long periods of time with effect and without danger (in one case two years and two months).

In the 58 cases of arrhythmia studied complete relief was obtained in 29, 6 others showed some benefit and 3 apparently were made worse. Toxic symptoms were rare, they were gastric distress, abdominal cramps, and diarrhea, diuresis was uncommon.

Capo reports, and illustrates with several electrocardiographic records, four observations of bigeminal rhythm occurring in heart patients with grave signs of cardiac insufficiency, following administration of small doses of digitalis or of ouabain. He analyzes the various pathogenic theories of this disturbance of cardiac rhythm and states that the appearance of bigeminal rhythm in the course of cardiac insufficiency may be considered a sign of grave prognosis. The patients studied died within two or three months after the development of the bigeminal rhythm.

Anderson has reported an interesting case of a woman twenty-two years old with paroxysmal tachycardia, who was entirely free from paroxysms throughout her pregnancy but had attacks during the last menstrual period before the pregnancy and the first one after delivery.

- Anderson D. F. Paroxysmal tachycardia associated with pregnancy. *Brit. M. J.* 1 657 1932
- Capo R. Regular extrasystolic bigeminal rhythm associated with cardiac insufficiency. *Clin. med. Ital.* 62 67 1931
- Sampson, J. J., and Anderson E. M. The treatment of certain cardiac arrhythmias with potassium salts. *J. A. M. A.* 99 2257 1932

AURICULAR FIBRILLATION AND AURICULAR FLUTTER

McEachern and Baker have reported a study of 575 consecutive cases of auricular fibrillation confirmed by electrocardiogram. The chief etiological relationships were as follows: rheumatic heart disease, 34.4 per cent, coronary disease and old age, 31.1 per cent, hypertension 16.9 per cent, thyrotoxicosis, 7.5 per cent, emphysema 5.0 per cent, syphilis 3.0 per cent, miscellaneous, 2.1 per cent. The age incidence was as follows:

0-9 = 0.5 per cent	50-59 = 26.1 per cent
10-19 = 4.2 per cent	60-69 = 20.5 per cent
20-29 = 5.4 per cent	70-79 = 7.8 per cent
30-39 = 15.0 per cent	80-89 = 0.3 per cent
40-49 = 20.2 per cent	

Stroud, Laplace, and Reisinger have reported their study of the etiology, prognosis, and treatment of 253 cases of chronic auricular fibrillation. They found no common etiologic factors.

Functional Vascular Disorders

Erythromelalgia has found fundamental criteria, according to Brown (1) bilateral burning pain in the extremities, (2) sharp increase in local heat of the affected parts, (3) production and aggravation of the distress by heat and exercise, and (4) relief by rest, cold, and elevation. Its etiology is unknown. Vasodilatation in the presence of polycythemia vera is common.

Allen and Brown have published an analysis of 204 cases of Raynaud's disease observed at the Mayo Clinic between January 1920 and July 1931. These cases they grouped as follows: uncomplicated, 147 cases, with scleroderma and arthritis and with or without gangrene or recurrent infections, 51 cases, and with gangrene or recurrent infections unassociated with scleroderma or arthritis, 6 cases. "Study of 147 cases of Raynaud's disease of the uncomplicated type indicates the disease is ordinarily an equivalent of psychoneurosis or neurasthenia. Operation on the sympathetic nervous system is the best method of treatment, offering a cure in the uncomplicated type of case."

White has published an interesting report of 6 cases of typical Raynaud's disease, with observations on the immediate and late effects of sympathetic neurectomy.

"Resection of the two upper dorsal ganglia or of the second to fourth lumbar ganglia brought about an immediate paralysis of sympathetic tonus in each case. Whereas vasomotor paralysis following lumbar sympathectomy has been permanent, the dorsal operation has been followed by a recurrence of sympathetic nerve function in 2 out of the 5 cases reported here and of 5 more operated on outside the hospital by members of the Vascular Clinic. Sympathetic nerve activity has reappeared at the end of six months, accompanied by the color changes, pain, coldness, and ulceration in the tips of the fingers characteristic of Raynaud's disease. When the regenerated vasoconstrictor fibres were again adequately blocked by novocaine or by reoperation, there was a second disappearance of the manifestations of the disease. Therefore, resection of the first and second dorsal sympathetic ganglia alone is insufficient to cause a permanent vasomotor paralysis of the arm. In our recent cases, where the operation has been extended upwards to include the inferior cervical ganglion, we are hopeful that the results will be as permanent as those in the lower extremity."

"Advanced stages of the disease with long-standing ulceration and sclerodermatous changes may fail to recover completely after vasomotor paralysis. These instances are satisfactorily explained by Lewis' theory of local pathology in the digital vessels."

"From the theoretical standpoint, early un-

complicated cases of the disease may be explained either on the basis of Raynaud's original conception of a vasomotor neurosis or by Lewis' theory that normal vasoconstrictor impulses cause the attacks of partial asphyxia by acting on abnormal digital arterioles. Certain objections have been pointed out against each hypothesis. It is therefore essential to reserve final judgment until the evidence in favor of one or of the other becomes unequivocal."

Allen E V and Brown G E Raynaud's disease. J A M A 99 1472 1932
Brown G E Vasodilatation disturbances affecting the extremities. A clinical study. Libman Anniversary Volumes. P 241 1932
White J C Raynaud's disease. Studies on post-operative cases bearing on the etiology of the disease and the efficiency of sympathetic ganglionectomy. New Eng J Med. 207 1198 1932

Angina Pectoris—Lian and his associates have published during the past year an extensive discussion of angina pectoris and other kinds of "heart pain" in the form of a volume of 425 pages, the first half of which takes up in detail the anginal syndrome itself and acute coronary thrombosis, while the second half takes up heart pain of other types, thoracic distress of reflex, neurotic, and toxic origin, and the differential diagnosis, prognosis, and treatment of all kinds of substernal and precordial pain. More attention than usual is directed to reflex pain and to medicinal and other types of nonsurgical treatment. The title does not indicate sufficiently the wide scope of the discussion.

Katz, Hamburger, and Lev studied the effect of hypodermic injections of 1 cc of 1:1,000 solution of epinephrine on a group of 6 cases of known angina pectoris, on a group of 6 normal internes, on a case of "irritable heart" with precordial distress, and on a case of luetic aortitis with precordial distress. The authors found epinephrine as a test for angina pectoris "to be unreliable in regard to both the symptoms produced and the electrocardiographic changes. This unreliability makes the test of little value, particularly in view of the severe reactions sometimes encountered." Three of the 6 cases of angina pectoris had no pain of any sort resulting from the injection of epinephrine and the others had pain not similar to their angina pectoris, except perhaps in one case.

White and Camp have reported 4 cases of status anginosus induced by tachycardia, in 3 cases paroxysmal auricular fibrillation and in the fourth case paroxysmal tachycardia. All 4 patients showed angina pectoris on effort. Two were men aged sixty-two and sixty-six years, respectively, and two were women aged sixty-eight and seventy-five. One of the men and one of the women died suddenly eighteen months and fifteen months, respectively, after the first

icated in the case of ventricular standstill and contraindicated in the case of ventricular fibrillation

Blumgart has reported the effect of the subcutaneous injection of 1/2 to 1 cc of 1:1000 solution of epinephrine on the circulation in 10 subjects. The velocity of blood flow through the lungs was increased in every subject, on the average of 76 per cent. "The velocity of blood flow from the arm to the heart, the pulse rate and the systemic arterial blood pressure were likewise increased. The metabolic rate was elevated by the administration of epinephrine, the increase ranging from 8 to 22 per cent and averaging 16 per cent."

Blumgart, H. L. The circulatory response to epinephrine. Libman Anniversary Volumes. P. 215. 1932.
Schwartz, S. F. and Jerez, A. The action of adrenalin on patients with complete heart block and Stokes Adams seizures. Am. Heart J. 7:652. 1932.

Intraventricular — Wilson, Macleod, and Barker have published data of their experimental work on dogs and clinical observations on 6 patients with bundle branch block which demonstrate conclusively that the old nomenclature must be revised, the common type of bundle

branch block being left branch block, the rare type right branch block. They made their observations chiefly by the use of semidirect leads (one electrode, the exploring electrode being placed close to the heart, the other—the indifferent electrode—at a distance from the heart, that is on a leg). Semidirect leads are essentially similar to direct leads. "In animals in which bundle branch block has been produced, the chief upstroke of the ventricular complex occurred early in those semidirect leads in which the exploring electrode was close to the surface of the contralateral, and late in those leads in which the electrode was close to the surface of the homolateral ventricle." "Serial precordial leads in cases of clinical bundle-branch block of the common type yield results similar to those obtained in experimental right branch block."

Smith reports that of 47 cases with bundle branch block, 44 died within eighteen months after coming under observation.

Wilson, F. N., Macleod, A. G., and Barker, P. S. The order of ventricular excitation in human bundle branch block. Am. Heart J. 7:305. 1932.
Smith, A. L. One sided branch block. A review of forty seven cases. Nebraska M. J. 17:179. 1932.

WHERE THE TYPHOID FEVER DEATHRATE IS STILL HIGH

As measures for the control of typhoid fever have been more and more widely extended the disease, from a country wide standpoint, has become a minor factor as a cause of death. This is clearly shown by the fact that, in 1932 the deathrate in seven states was less than 1 per 100,000, and in twenty states less than 2 per 100,000.

But, effective as has been the progress of sanitary science and of civic and domestic hygiene in reducing the typhoid fever death toll current records of mortality show that we are still far from the goal of absolute control.

There were, in 1932, seven states which still had typhoid fever deathrates of over 10 per 100,000. They comprise only 13 per cent of the total population of the country but they contributed 45 per cent of all the deaths from typhoid. Furthermore there were nine more states in which the 1932 typhoid fever rate ran 5 or over per 100,000. In the area within these sixteen states containing only 29 per cent of the population 71 per cent of all the typhoid fever deaths occurred last year.

The states with typhoid fever deathrates in excess of 10 per 100,000, in 1932, were South Carolina (14.6), Kentucky (13.0), Georgia (12.5), Arkansas and West Virginia (each 12.4), Tennessee (11.6) and Louisiana (10.9). The average typhoid deathrate in this group is today about double the average rate

for the entire Death Registration Area ten years ago. These are all Southern or "Border" states, and one might surmise that their high rates were due solely, to excessive mortality from this disease among their Negro populations. But this is by no means the case. In all of these states the whites suffer high typhoid mortalities, running from nearly double to more than three times the average for the white population of Continental United States. The highest figure is that of Kentucky (12.7 per 100,000) followed by Arkansas with 10.4, Tennessee, 9.8, Louisiana, 7.8, Georgia, 7.2 and South Carolina, 5.8. The figures for West Virginia, by color, are not available at this writing.

Although it is true that, for the most part, typhoid control is a problem of rural sanitation high mortality rates are by no means confined to the rural district. Rates in excess of 10 per 100,000 were recorded, in 1932, in Chattanooga (12.9) and Memphis (10.6), and in Knoxville and Atlanta the rate was 9.8 and 9.5, respectively. Other cities where the typhoid mortality was well in excess of that for the population of the United States were New Orleans, Nashville, Dallas, Oklahoma City, and El Paso. The figures for Nashville are unique, in that they show that the mortality in the white population was nearly double that among the Negroes. In New Orleans the typhoid fever deathrate among white persons closely approached that for the colored population.—*Bulletin Metropolitan Life Insurance Co.*

and concluded that "the presence of auricular fibrillation does not necessarily imply a worse prognosis than in the unfibrillating heart with an equal amount of cardiovascular damage"

In this series, the average age of onset of auricular fibrillation due to rheumatic cardiovascular damage was thirty-nine years. The prognosis was very poor in patients developing this arrhythmia before the age of twenty-five years. The average age of onset of auricular fibrillation in the arteriosclerotic (nonrheumatic) group was about fifty-nine years.

As to treatment of patients with auricular fibrillation, the authors conclude that "digitalis usually proves most satisfactory." "Although there appears to be little danger of accident from the use of quinidine sulphate in properly selected cases of auricular fibrillation, yet we feel this drug should only be used in those few cases of younger individuals with slight or no demonstrable cardiovascular abnormality except the arrhythmia, or in thyrotoxic patients following partial thyroidectomy without a spontaneous return to normal sinus rhythm."

McMillan and Bellet have published an analysis of 65 cases of auricular flutter, among 55 of these 12 were paroxysmal and 43 established, 7 of the remaining 10 were due to drugs (including digitalis) and 3 were unclassified. Normal rhythm was restored in two-thirds of the cases. The method of choice was digitalis therapy until auricular fibrillation was established and then quinidine if normal rhythm did not occur spontaneously.

McEachern D and Baker B M Jr. Auricular fibrillation. Its etiology, age incidence and production by digitalis therapy. *Am J M. Sc.* 183 35 1932

McMillan T M and Bellet S. Auricular flutter, some of its manifestations and its treatment based on study of sixty-five cases. *Am J M. Sc.* 184 33 1932

Stroud W D, Laplace, L B and Reisinger J A. The etiology, prognosis and treatment of auricular fibrillation. *Am J M. Sc.* 183 48 1932

Quinidine therapy—Levine has reported a series of 36 experiments on cats demonstrating that quinidine sulphate tends to inhibit the occurrence of ventricular fibrillation on faradic stimulation.

Newman and Spiro have reported their experience with the use of quinidine in treating auricular fibrillation in a series of 66 patients over an interval of several years. Sinus rhythm was restored in 54 cases, or 82 per cent. Of these 54 patients, 12, or 30 per cent, reverted to auricular fibrillation before the end of one year, 28, or 70 per cent, maintained normal rhythm for one year or more, 28, or 57 per cent, for two years or more, 14, or 35 per cent for three years or more, 8, or 20 per cent, for four years or more, 3, or 7 per cent, for five years or more, and 2, or 5 per cent, for six years or more. Of the 66 patients who were treated, 3 died within a few hours of the restoration of normal rhythm,

3 more patients were alarmingly poisoned and 6 moderately so. The larger the heart, the less satisfactory the therapy.

McGuire has treated "approximately 50" patients with "extrasystolic irregularities" with quinidine sulphate (2 to 5 grains, three times a day) in the Cincinnati General Hospital over an interval of several months and has found that in a small group of the cases without evidence of heart disease the drug abolished the extrasystoles or reduced them in frequency in 85 per cent. In the second group, patients with organic heart disease but without congestive failure, the drug rarely caused the premature beats to disappear, it did, however, usually diminish their frequency.

Levine H D. Effect of quinidine sulphate in inhibiting ventricular fibrillation experimental study. *Arch Int Med.* 48 808 1933

McGuire J. Extra systoles and their treatment with quinidine sulphate. *Ohio State M. J.* 28 260 1932

Newman W W and Spiro H. Quinidine therapy in auricular fibrillation. *California & West. Med.* 37 19 1932

HEART BLOCK Auriculoventricular—Mahaim has written an extensive monograph on the pathology and clinical manifestations of lesions of the bundle of His and its branches, with detailed reports of the histological examination of serial sections in 20 cases, the majority showing either A-V block, bundle branch block, or both. A notable conclusion is that rarely is there a localized lesion in the A-V conduction system, main bundle and both branches are usually all affected in greater or lesser degree in the same case.

Don, Grant and Camp have reported a case of complete heart block in which the ventricular complexes of the electrocardiogram varied in form, and which showed at postmortem examination destruction of the bifurcation of the A-V bundle, thus separating the main bundle from its branches and the right branch from the left. The patient was a man aged sixty-eight years.

Grant and Camp have described a case of complete heart block developing in an adult (a man aged forty years) during the last few months of life. At postmortem examination the terminal portion and bifurcation of the A-V bundle were found destroyed by an arterial angioma.

Don C S D, Grant, R T and Camp P D. A case of complete heart block with varying ventricular complexes. *Heart.* 16 145 1932

Grant, R T and Camp P D. A case of complete heart block due to an arterial angioma. *Heart.* 16 137 1932

Mahaim I. Les Maladies Organiques du Faisceau de His-Tawara. Les Syndromes Coronaires. L'Endocardite Septale. L'Infarctus Septal. *Étude Clinique et anatomique.* Masson et Cie. Paris 1931. 596 pages. 188 illustrations.

Effect of Epinephrine—Schwartz and Jezer have reported Adams-Stokes attacks in 4 cases, 2 with ventricular standstill at intervals and 2 with periods of ventricular fibrillation, both mechanisms causing syncope. Adrenalin is in-

The patient remained in a semistuporous state, looking moribund, and developed a coarse rattle in his throat. His white blood count rose to 67,000 two days after admission. On the third day the abdominal tenderness was generalized, with resistance but no real spasm. He was given daily injections of 25 per cent glucose subcutaneously. On the fourth day he became comatose and died.

DIFFERENTIAL DIAGNOSIS

DR. ARLIE V. BOCK The total history as given here leaves us with a very confused picture as to the probable cause of death. There are various complicating statements in the record.

We have to take into account in the first place that he was seventy years old and that the presenting symptoms were loss of weight and shortness of breath. These can be due to a great many factors. The factor of marked loss of weight practically rules out his heart as a cause of shortness of breath and we have to consider as a cause of these presenting symptoms severe anemia, primary anemia or a secondary anemia due to blood loss or some type of leukemia, or, going to the lungs, chronic pulmonary tuberculosis, bronchiectasis or possibly malignant disease in the lung. Then one has to think of the possibility of malignant disease anywhere in the body reaching an end stage, producing anorexia and a generally hopeless physical state.

The remarks to the effect that he had no cough, sputum, hemoptysis or wheezing seem to me to rule out pathology in the lung as a cause of the condition. If he had an old tuberculosis that suddenly flared up we should have more facts than these. The same is true of bronchiectasis. It does not exclude the possibility of a primary carcinoma of the bronchus.

The story that his diet is well balanced does not agree with the statement further down that he had no teeth. Presumably some of his weight loss was due to the fact that his diet was inadequate. I might have mentioned that he was an unemployed chauffeur. If he had been having inadequate food because of unemployment, that may have been a factor in the loss of weight.

Typhoid fever thirty-three years before entry has only the possible significance that he may have developed gall stones subsequently.

His physical examination suggests the possibility of his trouble being in the lung, but there does not seem to be any definite evidence that whatever change he has in his lung is anything of a chronic type which he has had for many years, and I doubt if it plays any rôle in the present picture.

The heart is normal.

The liver dullness on the right is somewhat high.

I think the restriction of the left chest, the change in the size of the left chest and the cal-

cified pleura as shown in this x-ray probably have nothing to do with the present history of shortness of breath.

There seems to be a disagreement as to whether or not a mass was present in the abdomen. One examiner found a palpable mass to the right of the epigastrium and subsequent observers found no evidence of such a mass.

It seems to me the only really significant thing is the x-ray examination. Aside from the old findings is this peculiar bulge in the right diaphragm, which conceivably might be due to a weak diaphragm with a little tendency to herniate through, or to adhesions. If there were adhesions causing it, however, one would expect obliteration of the costophrenic space, and I think the mass felt in the abdomen, in conjunction with the total history, is of great significance in this picture.

From the history just prior to the last admission, when he began to make irrational remarks and to have transitional episodes of disorientation, one gets the impression that two things might be in the background. One is the degree of arteriosclerosis that he had, together with whatever influence dehydration might be playing. I do not know from the notes whether the man was having an adequate intake of fluids or not, but in the presence of dehydration at this age he could have this picture. The symptoms are however also consistent with frontal lobe tumor, which would have to be metastatic presumably, and in view of the x-ray findings in the lung it seems very unlikely that he could have a metastatic lesion in the head. I think metastases do occur in the brain rarely without evidence of pulmonary lesions, do they not?

DR. TRACY B. MALLORY Yes.

DR. BOCK That is however a very rare condition. On the whole I should be inclined to attribute the cerebral symptoms to arteriosclerosis, emaciation, dehydration and the general sick state in which this man found himself.

The rest of the notes are confusing. The surgeon apparently did not think there was any pathology in the abdomen. Previous examiners thought there was.

As to the terminal state of coma, I do not know whether he was in coma or was semistuporous. The notes are confusing about that, but I take it that it was not frank coma, that there was some ability to cooperate. This was probably a terminal manifestation.

The high white cell count with a high count of polymorphonuclears is certainly difficult to explain in a man of this age with no more than he shows, no fever and nothing to suggest a cause for a lesion like peritonitis. There is no reason to suspect a ruptured viscus such as perforated duodenal ulcer or gastric ulcer.

It seems likely that the underlying condition is a malignant process involving the liver, but the mass as described in the right epigastrium

CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M D

F M PAINTER, A.B., ASSISTANT EDITOR

CASE 20011

PRESENTATION OF CASE

DR AUGUSTUS S ROSE * A seventy year old unemployed chauffeur entered the Outpatient Department complaining of loss of weight and shortness of breath

Four months before admission the patient noticed slight dyspnea, gradually increasing in severity and most marked on going upstairs. There was no cough, sputum, hemoptysis or wheezing. There had never been any substernal or referred pain. Recently there had been loss of appetite but no vomiting. His bowels had been fairly regular, requiring a light cathartic about every other week. His diet was well balanced. For the past four months he had had nocturia three or four times at night. There was no dysuria or hematuria. He had lost thirty pounds in weight during the past year.

The family history is irrelevant.

He had been married thirty-three years. His wife was living and well. She had had three children and one miscarriage due to accident.

He had typhoid fever thirty-three years before entry, pleurisy forty years before entry and rheumatism twenty-eight years before entry but no swelling of the joints. He had a concussion from a fall on the ice in his youth.

He smoked a pipe continually and used a moderate amount of alcohol daily.

On physical examination the patient was poorly developed and emaciated. The pupils reacted sluggishly to light and accommodation. The fundi showed hazy disks. All the teeth were missing. The left chest was nearly fixed on respiration, though there was some excursion of the diaphragm on percussion, but the right side seemed to compensate. The lungs were negative. The heart was not enlarged, no thrills or murmurs, no increased supracardiac dullness. The blood pressure was 120/80. Liver dullness, fourth space anteriorly on the right. Abdomen there was a sensation of fullness in the midepigastria to the right epigastric region, and a palpable mass on further examination. There was no tenderness or spasm. The mass moved with respiration but was not freely movable. It measured approximately 10 centi-

meters in diameter. There was a hard, freely movable non-tender lump on the left scrotum.

A gastro-intestinal x-ray series was negative. A chest film showed calcification in the left axillary pleura, bilateral apical infiltration and fibrosis, a straight left diaphragm and a bulge in the right diaphragm. The right costophrenic angle however was clear. The right diaphragm moved well with respiration. The findings were those of calcification of the pleura, bilateral apical fibrosis, arteriosclerosis, tortuosity of the aorta and fixation of the left diaphragm.

Laboratory examination of the urine was negative except for a very slight trace of albumin and a rare white blood cell.

The patient was seen two weeks later in the Pulmonary Clinic. Nothing further was added to the previous diagnosis of healed tuberculosis. A urological consultant found the prostate not enlarged and very definitely benign. There was no suggestion of cancer.

The patient was admitted to the wards approximately five months after his last visit to the Outpatient Department because of coma for the past five days.

Since his discharge from the Outpatient Department there had been very little change in his condition until three weeks before admission, when he began to make irrational remarks and it was fairly obvious that he was having transient episodes of disorientation. Five days before entry he began to have occasional visual and auditory hallucinations and two days later slurring speech. Since then he had been semistuporous and had taken no food or fluids. He had no headaches, paresthesia or paralysis.

Physical examination was practically the same as in the Outpatient Department. The blood pressure was 90/60. The abdominal fullness was still present, with slight spasm in the right upper quadrant and definite tenderness upon moderate pressure. The biceps reflexes, knee jerks and ankle jerks were present but weak.

The temperature on admission was 99.2°, the pulse 90. The respirations were 26.

The urine showed a trace of albumin, a specific gravity of 1.010, and was otherwise negative. Blood the white cell count was 55,000, 95 per cent polymorphonuclears, the red cell count 4,170,000. A lumbar puncture showed a very low pressure but good rise on jugular compression. The fluid was clear, colorless and negative. The non-protein nitrogen was 41 milligrams. The carbon dioxide combining power was 54.5 volumes per cent. A fasting blood sugar was 105 milligrams. The blood chlorides were 5.96 milligrams.

A surgical consultant believed that thrombosis was the source of the high white blood count but did not think that the abdomen was the site of disease.

*Senior interne on the East Medical service.

at autopsy the tumor was undoubtedly much larger than it was at the time of this examination

DR BOCK Was no more said in the x-ray interpretation of that film than was put in this record?

DR MALLORY No

DR HOLMES Did he have esophageal varices?

DR MALLORY None that we were able to find I think there is no question that we miss slight varices at autopsy They collapse and are much less obvious then than they would be during life

This microscopic section of the liver shows a moderate though not very severe cirrhosis with large amounts of yellow-brown pigment in the liver cells and stroma In this second section it has been stained black with ammonium sulphide

The tumor itself is a very scirrhus affair, with much connective tissue and relatively few tumor cells What cells one finds have a tendency to be in glandular arrangement and they bear no resemblance in either their arrangement or appearance to liver cells It is obviously an adenocarcinoma, and as a very careful search was made for a possible primary focus everywhere in the body, I think we are safe in saying it is a primary bile duct carcinoma on the basis of long standing hemochromatosis

DR BOCK Can you explain his terminal leukocytosis?

DR MALLORY Only partially We found in the cecum an area of bright red injection The appendix was perfectly normal The cecum was acutely inflamed There were no thrombi in the vessels running either to or from this area There was no mesenteric thrombosis One has to call it an acute typhilitis, which we see once in a while with a negative appendix

DR CABOT Certainly terminal leukocytoses unexplained at autopsy are common You do not need an explanation

DR MALLORY Yes, but sixty thousand is pretty high

DR BOCK That needs an explanation, but we do not know what it is

DR CABOT We often do not

DR MALLORY It is not impossible that there was enough necrosis in this tumor to be partially responsible, although one does not usually see counts over twenty thousand with that

DR BOCK Would you agree that the cerebral condition might be a question of malnutrition, dehydration and arteriosclerosis rather than a possibility of a frontal lobe tumor?

DR MALLORY I think that is perfectly possible The patient was practically moribund on the final entry I do not believe we need much more explanation than that

CASE 20012

PRESENTATION OF CASE

DR AUGUSTUS S ROSE * *First admission* A forty-seven year old American Hebrew newspaper man entered for the first time four years and a half before his final admission with the complaint of pain in the chest and left arm of three days' duration

Four days before admission while at lunch he had a sudden sharp pain in the midsternum and left arm The pain first appeared in the chest but very quickly became evident in the arm, although there was no radiation The pain became very severe and "felt like it was trying to break through" This attack was associated with sweating and nausea but no vomiting He was taken to an emergency relief station where he was put to bed and given a hypodermic He remained at this hospital for two days and then returned home On the night before admission shortly after he went to bed the pain suddenly recurred in both the mid-chest and arm He was taken to the Emergency Ward of this hospital and during the examination he had three more similar attacks He was given nitroglycerin, which appeared to lessen the pain a great deal He was transferred to the wards

His family history is irrelevant He had always done hard work He had been a pugilist for eight years, but gave it up twenty years before entry He smoked six or eight cigars a day and consumed only moderate amounts of alcohol, never excessive For the past three years he had worked in the mailing room of a newspaper establishment

He had gonorrhea at twenty-six which was apparently cured in one year under treatment Two years later, however, he was operated on at a hospital for stricture At about the same time he developed arthritis which he was told was due to gonorrhea He was treated with serum injections and since then had been apparently well

Physical examination. He was a fairly well developed and nourished man There was no cyanosis or pallor of the mucous membranes The heart was not enlarged The sounds were regular and of fair quality There were no murmurs The blood pressure was 140/105 He had an attack during the examination, relieved by nitroglycerin The blood pressure fell to 115/80 The heart sounds were louder and of better quality Half an hour later the blood pressure returned to 140/105

Examination of the urine was negative Examination of the blood showed a red cell count of 5,500,000, 94 per cent hemoglobin, and a white cell count of 13,500 with 65 per cent poly-

*Senior interne on the East Medical service.

is a little difficult to tie up with the liver. It might easily be a mass in the stomach, but that seems to be ruled out by the gastro-intestinal series. A mass in the pancreas as palpable as this seems to have been at one time would easily give enough compression on the common duct to produce jaundice. The only other lesions that I can think of in the epigastrium are the possibility of aneurysm—and he is too old for that—and a large cyst of the pancreas which might not be giving pressure on the common duct.

I cannot make a diagnosis on the case, but my belief is that he had a malignant process in the liver and that the chances are that the abnormality in the diaphragm was caused by a metastatic portion of it. Whether he had a terminal peritonitis I do not know. We have seen terminal leukocytoses without any adequate explanation, and we have not been able to account for it. The tenderness over the abdomen suggests peritonitis, but if it is peritonitis I am at a loss to explain the origin of it. After taking everything into account I cannot even guess at a diagnosis except for the probable finding of malignant disease involving the liver.

CLINICAL DISCUSSION

DR GEORGE W. HOLMES: As Dr. Bock pointed out, we have evidence of an old tuberculous process with calcification of the pleura that may have some bearing on this deformity.

Deformities of the diaphragm are due to a number of causes. It is perfectly possible that he has a mass in his liver, either gumma or metastatic malignancy, which is pushing the diaphragm up and giving the appearance seen. A local atelectasis in the lung with a thin flabby diaphragm will produce such a picture. Adhesions to the pleura will do it, and it is not necessary for them to extend into the costophrenic sinus. Adhesions can produce deformity in the outline of the diaphragm. This man has had tuberculosis, and we have to consider adhesions, although this is not the deformity one expects with adhesions. Then we may have difference in the contraction of the muscles of the diaphragm producing double curves and peculiar shapes similar to this. Any deformity of the liver appears when the diaphragm is pulled down hard across it. It is difficult to draw any definite conclusions from deformities of the diaphragm alone. This one is quite marked, and from the story one would agree with Dr. Bock that this ought to be seriously considered in the diagnosis.

The movement of the diaphragm in these cases is of importance. A non-inflammatory mass as a rule will not interfere with respiratory motion. An inflammatory mass causing this deformity would cause definite limitation in the excursion of the diaphragm. The lung markings are unusually large and bright and the dia-

phragm low, which I think would be against peritonitis. A man with even local peritonitis is apt to have elevation of the diaphragm rather than a low diaphragm.

He has a rather small heart shadow. That may be due in part to the low position of the diaphragm with rotation of the heart. He also has a prominent aortic knob, which is characteristic of arteriosclerosis.

I would agree with Dr. Bock again that if this is a mass in the liver it is probably not gumma but is more likely to be a metastatic nodule or an anatomic variation.

CLINICAL DIAGNOSES

Generalized arteriosclerosis
Mesenteric thrombosis?
Peritonitis?

ANATOMIC DIAGNOSES

Primary carcinoma of the intrahepatic bile ducts with metastases to retroperitoneal lymph glands

Acute typhlitis
Healed apical tuberculosis, bilateral
Fibrous and calcareous pleuritis, left
Hydrothorax, right
Fibrous pleuritis, right
Tracheitis and bronchitis, slight
Ascites, slight

Arteriosclerosis, moderate coronary, moderate to marked aortic, moderate renal
Benign prostatic hypertrophy

PATHOLOGIC DISCUSSION

DR MALLORY: There is no question that the data both on the history and the physical examination are inadequate for a diagnosis in this case beyond the point which Dr. Bock reached.

The patient had malignancy of his liver and it turns out to be a primary carcinoma in the liver, not a hepatoma but a carcinoma of the intrahepatic bile ducts. Nearly all primary cancers of the liver, whether hepatomas or bile duct carcinomas, arise in cirrhotic livers, and this man had a markedly cirrhotic liver due to hemochromatosis, which was quite marked. The pigmentation did not extend however to his skin, so that there was no reason to suspect it clinically, and he did not have sugar in the urine at any time.

DR RICHARD C. CABOT: Was there anything in his brain?

DR MALLORY: We did not have a chance to examine that.

This is a cross section of the liver. There is the large nodule rising from the superior surface just where the x-ray films showed the irregularity in the diaphragm. That x-ray film was taken several months before his death and

attacks were not at all like his old anginal attacks. They were relieved by soda. The edema gradually became more marked and for two weeks before his fifth admission he noticed some swelling of the abdomen.

Fifth admission four months and a half after his fourth discharge.

Physical examination showed a slightly wasted middle-aged man in no distress. There was slight cyanosis of the lips. The radial vessels were slightly thickened. The blood pressure was 160/116. There was no change in the heart findings. The abdomen was moderately distended. The liver was felt four to five finger-breadths below the costal margin and was slightly tender. There was dullness in the flanks with slight fluid wave. There was moderate edema of the lower extremities and sacrum.

The urine examination showed a slight trace of albumin and six to eight white blood cells. The red blood cell count was 6,300,000, the hemoglobin 80 per cent. The white cell count was 10,400, with 74 per cent polymorphonuclears. A phenolsulphonophthalein test showed 45 per cent excretion in one hour.

During the first week in the hospital he was given three injections of salyrgan, which failed to relieve the edema. On the ninth day his temperature rose to 103°, the pulse to 115. Three days later the temperature reached 107°, the pulse 128 and the respirations 52. The non-protein nitrogen was 60 milligrams. He rapidly failed after this and died on the thirteenth day.

DR. GEORGE W. HOLMES. The film that we have was taken at the first admission and was interpreted at that time as not showing anything definitely abnormal. I would agree with that interpretation except to add that possibly the aortic knob is a little prominent for a man of that age.

DIFFERENTIAL DIAGNOSIS

DR. WILLIAM B. BREED. There are two comments I should like to make about the past history in this case. One of them is about the statement that he had always done hard work and had been a pugilist for eight years prior to twenty years before admission, which would indicate that he led a rather strenuous physical life. Also, the person who made the excerpts thought we would be interested in the venereal aspect and mentioned that he had had severe gonorrhea and had been treated with "serum injections" at one time. Perhaps that was to attract my attention towards the question of syphilis, but I think that there is very little evidence on physical examination, in the history, or apparently in the x-ray films, which I had not seen before, that he had luetic aortitis or an aneurysm.

I think it is fairly obvious that he had angina pectoris, but of course angina pectoris literally translated means nothing more or less than pain

in the chest. We have interpreted it as a characteristic precordial pain with radiation to the right or the left arm. The onset of this man's first attack certainly does not sound like the clinical description of angina pectoris as such. It is very much more suggestive of a coronary occlusion which does produce pain in the chest, indicating a faulty functioning of the coronary vessels. I think he undoubtedly had at least three or four occlusions with cardiac infarct and between such occlusions rather persistently the symptom complex of angina pectoris on the basis of his coronary disease.

His first electrocardiogram apparently was taken before there was any digitalis given and that certainly indicates that there is some abnormality in the coronary circulation and the last electrocardiogram shows more than could be accounted for on the basis of digitalis poisoning. There is a slurred and widened QRS along with left axis deviation and diphasic T₂.

As to the question of fibrillation, Dr. Rose said that he was suspected of having it. The association of auricular fibrillation with angina pectoris, especially in a case of short duration, is not common. It does occur, but I should be more inclined to think that the irregularity was not true auricular fibrillation at that time.

What did he die of? At the end he had a very high temperature. According to the record I should be inclined to think that he did not die of a terminal large coronary occlusion but rather from pulmonary infarcts, pneumonia, or massive cerebral hemorrhage. You note that his temperature rose to 107°, his pulse to 128 and the respirations to 52. I should think his was probably not as I said, primarily a coronary or a cardiac infarct death. I should expect to find that he had a large arteriosclerotic heart with probably a number of infarcts, old infarcts and perhaps one more recent one occurring at the time of his last admission, and a good deal of pathology in the lungs, either pneumonia alone or pulmonary infarcts.

DR. WILLIAM D. SMITH. I saw this man at two of his admissions. I did not see him at the time he died. There is not very much to add. Dr. Breed has covered the case pretty well. I think that the first time I saw him the patient had hypertensive and arteriosclerotic disease, that his symptoms were due to coronary disease quite definitely, and that he probably had had two or three small coronary infarcts in the past. The last time he came in I felt that he had another coronary accident and congestive failure.

Whether or not he had pathology in the lungs at the end I do not know. I should think it unlikely that he had a cerebral hemorrhage because his temperature went up rather gradually and there is nothing in the record to suggest a cerebral accident. He might well have had terminal pneumonia or pulmonary infarcts.

morphonuclears Examination of the stools was negative The non-protein nitrogen was 34 mgm The Hinton and Wassermann tests were negative

An electrocardiogram showed normal rhythm, rate 110, inverted T_2 and T_3 , left axis deviation and slight slurring of the QRS complex in lead II

The temperature was 99.1° , the pulse 90 The respirations were 20.

He remained in the hospital for nine days and was discharged to his home, which was very near by, to remain in bed for at least another week

History of interval After his discharge he was followed in the Cardiac Clinic He led a limited life and took very good care of himself He had occasional substernal discomfort with left ulnar paresthesia, too short however to take nitroglycerin. These attacks increased in frequency It was felt in the Cardiac Clinic that his heart was getting larger His blood pressure gradually rose to 175/120 and he developed some dyspnea on exertion Two weeks before readmission he had a more severe attack which was relieved by nitroglycerin On the day of readmission, while at work, he had the most severe attack since the previous year This attack was not relieved by two tablets of nitroglycerin

Second admission, fifteen months after his previous discharge

Physical examination showed that he was in some distress and was anxious His lips were cyanotic The heart was slightly enlarged, the measurements were midclavicular line 9.5 centimeters, supracardiac dullness 6.5, right border of dullness 4, left border 10 The blood pressure was 176/120 There were no murmurs There were râles at both bases There was no peripheral edema

The temperature was 98° , the pulse 93 The respirations were 21

Two days after admission his temperature rose to 100° His white blood cell count was 18,900 There was a mild fall in blood pressure The heart sounds were feeble No friction rub was heard He was discharged in twenty days

History of interval For the first month following discharge he got up very gradually and in the second month he started back to work He then began to have a few attacks which were always relieved by nitroglycerin Most of the pain was tingling or limited to the left forearm On the day before admission he had an attack during an argument at a ball game which was relieved half an hour later after he had gone home in order to get nitroglycerin The pain recurred however and he entered the Emergency Ward

Third admission, three months after his second discharge

Examination was essentially the same as on the previous admission The blood pressure was 185/120

Digitalization was maintained When first seen he was fibrillating This lasted for twelve hours, then gallop rhythm set in and lasted for two or three days The heart then became slow and regular

His white blood cell count, which on admission was 13,000, dropped to 7,000 An electrocardiogram showed normal rhythm, rate 90, left axis deviation, diphasic T_2 and inverted T_3

He was discharged much improved at the end of three and a half weeks

History of interval After discharge his condition remained about the same Even moderate exertion produced anginal attacks, relieved by nitroglycerin He had no other cardiac symptoms however He took digitals a grain and a half daily For a week before readmission his pain was more severe than usual and not so readily or completely relieved by nitroglycerin On the morning of admission at breakfast he developed a very severe pain which radiated down his left arm to the first two fingers Associated with this was choking substernal distress which radiated to his right shoulder This was relieved only by morphia after three hours

Fourth admission three years after his third discharge

Examination showed slight cyanosis of the lips There were fine and medium moist râles in the lower halves of both lungs posteriorly and slight dullness at the left base The heart was definitely enlarged to the left, being 12 centimeters to the left of the midclavicular line The blood pressure was 160/120 The sounds were of only fair quality, regular, no gallop rhythm There was slight precordial tenderness

The white blood cell count was 10,350, 77 per cent polymorphonuclears

An electrocardiogram showed normal rhythm, rate 80, inverted T_1 , diphasic T_2 , slurred and widened QRS and left axis deviation

He remained in the house for three weeks and was discharged greatly improved, with a blood pressure of 115/80

History of interval After discharge he was kept on digitals three grains daily, nitroglycerin and luminal Although he was on limited activity he began to have attacks of choking and of coughing and anginal attacks at night, forcing him to sit up most of the night He had occasional attacks of nocturnal dyspnea, which became more severe two months before admission Five weeks before admission he developed swelling of the ankles for the first time Three weeks before admission he began to have upper abdominal and substernal non-radiating pain which was worse upon exercise and after meals These

attacks were not at all like his old anginal attacks. They were relieved by soda. The edema gradually became more marked and for two weeks before his fifth admission he noticed some swelling of the abdomen.

Fifth admission four months and a half after his fourth discharge.

Physical examination showed a slightly wasted middle-aged man in no distress. There was slight cyanosis of the lips. The radial vessels were slightly thickened. The blood pressure was 160/116. There was no change in the heart findings. The abdomen was moderately distended. The liver was felt four to five finger-breadths below the costal margin and was slightly tender. There was dullness in the flanks with slight fluid wave. There was moderate edema of the lower extremities and sacrum.

The urine examination showed a slight trace of albumin and six to eight white blood cells. The red blood cell count was 6,300,000, the hemoglobin 80 per cent. The white cell count was 10,400, with 74 per cent polymorphonuclears. A phenolsulphonephthalein test showed 45 per cent excretion in one hour.

During the first week in the hospital he was given three injections of salyrgan, which failed to relieve the edema. On the ninth day his temperature rose to 103°, the pulse to 115. Three days later the temperature reached 107°, the pulse 128 and the respirations 52. The non-protein nitrogen was 60 milligrams. He rapidly failed after this and died on the thirteenth day.

DR. GEORGE W. HOLMES. The film that we have was taken at the first admission and was interpreted at that time as not showing anything definitely abnormal. I would agree with that interpretation except to add that possibly the aortic knob is a little prominent for a man of that age.

DIFFERENTIAL DIAGNOSIS

DR. WILLIAM B. BREED. There are two comments I should like to make about the past history in this case. One of them is about the statement that he had always done hard work and had been a pugilist for eight years prior to twenty years before admission, which would indicate that he led a rather strenuous physical life. Also the person who made the excerpts thought we would be interested in the venereal aspect and mentioned that he had had severe gonorrhea and had been treated with "serum injections" at one time. Perhaps that was to attract my attention towards the question of syphilis, but I think that there is very little evidence on physical examination, in the history, or apparently in the x-ray films, which I had not seen before, that he had luetic aortitis or an aneurysm.

I think it is fairly obvious that he had angina pectoris, but of course angina pectoris literally translated means nothing more or less than pain

in the chest. We have interpreted it as a characteristic precordial pain with radiation to the right or the left arm. The onset of this man's first attack certainly does not sound like the clinical description of angina pectoris as such. It is very much more suggestive of a coronary occlusion which does produce pain in the chest, indicating a faulty functioning of the coronary vessels. I think he undoubtedly had at least three or four occlusions with cardiac infarct and between such occlusions rather persistently the symptom complex of angina pectoris on the basis of his coronary disease.

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DR TRACY B MALLORY Have you anything to say, Dr Richardson?

DR WYMAN RICHARDSON I have very little to add I saw him simply in the terminal stages of the disease I was interested in his high temperature, which I attributed purely to his cardiac failure I think it is an interesting question as to the cause of the temperature in cardiac failure I believe it is supposed to be at least partly due to the failure of the heat regulating mechanism due perhaps to failure of the peripheral circulation

DR HOWARD B SPRAGUE I think I followed this man more closely in the last five years than anyone else There are two or three points to bring out One is that he was an extremely nervous man whose symptomatology was difficult to assess He had from time to time definite findings indicating coronary occlusion that made us believe he had progressive coronary disease in spite of the confusing elements of the neurosis

Another point is that he did not have, as I remember it, at any time very characteristic electrocardiograms indicating massive infarct

One other point is that I felt he was a patient who had a rare type of anginal equivalent, that is regurgitation of food, or vomiting after eating, which is comparable to the belching that one sees in cases with coronary disease

CLINICAL DIAGNOSES

Arteriosclerotic heart disease with congestive failure
Angina pectoris

ANATOMIC DIAGNOSES

Coronary sclerosis with multiple areas of occlusion
Cardiac infarction, old and recent
Pulmonary infarcts
Acute bronchitis
Chronic vascular nephritis

PATHOLOGIC DISCUSSION

DR MALLORY The autopsy on this man showed a large area of infarction not in the usual place near the apex of the left ventricle, but on the posterior wall of the left ventricular wall up towards the base, and corresponding with that the point of maximum narrowing in the coronary branches was not in the descending branch of the left coronary but in the circumflex branch of the left with a second one in the corresponding branch of the right, which came over very close to the edge of the infarct Both these branches were extremely narrow There

was a point where there was hardly any visible lumen left There was however fluid blood in each vessel that could be expressed with slight pressure, and there was no evidence of any fresh thrombosis In other words, he had extreme narrowing of one branch of the left and one branch of the right coronary, but no complete occlusion at any point in either artery

The area of infarction showed two distinct zones, a central one which was fibrous and evidently old and a peripheral one which showed hemorrhage and was obviously quite fresh, I think coincident with his last entry to the hospital I believe it is fairly common for multiple infarctions to appear at approximately the same area in the heart, so that even when a clinical history suggests two or three infarcts we may be able to find only one, since the various lesions have been superimposed and the scars more or less merged

The lungs showed several infarcts, relatively small ones The largest was about 5 centimeters in diameter There was no pneumonia

We were not allowed to examine the head, so I do not know whether there was any cerebral accident

A PHYSICIAN Will you say more about the superimposition of one infarction upon another? What happens? What is the mechanism?

DR MALLORY There are several reasonable hypotheses to cover such a situation In the first place infarction does not necessarily destroy all the muscle cells in an involved area, in fact the distribution is often peculiarly irregular Hence a second infarction might easily involve the remaining muscle cells of exactly the same area Probably however necrosis of another area in immediate apposition with the first is more usual Several vascular mechanisms might be imagined which would cover such situations A completely thrombosed vessel not infrequently recanalizes to a significant extent A new thrombosis of the canalizing vessel would result in a second infarct of closely similar distribution Moreover the coronary arteries are not anatomically speaking end arteries, hence collateral circulation always limits and occasionally prevents infarction in the face of thrombosis Sufficient narrowing of the collateral branches might extend the area of necrosis Finally it is by no means impossible that infarction may occur without thrombosis, simply from prolonged spasm If this is true, another spastic episode or a final thrombosis would again lead to superimposed or nearly superimposed infarcts

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OF WHAT SHALL DIABETICS DIE?

MASSACHUSETTS holds an enviable record in its reduction of the mortality of diabetic coma. Whereas formerly, both here and abroad, 60 per cent of all diabetic deaths were due to coma, the rate in Boston for the first 11 months of 1933 was 11 per cent. The rate in a city considerably larger than Boston was, according to a recent compilation, more than three times as great. So too, the Boston proportion of diabetic deaths due to gangrene was 15 per cent in contrast to 23 per cent in the other city.

So far so good, but we should not be content. No diabetic should die from coma and much fewer than at present should die from gangrene, because that, too, is largely preventable. The further and more energetic application of the same methods, which have lowered the mortality of these diabetic complications, will accomplish much more. Education in diabetic fundamentals is the outstanding need, and it is only by teaching line upon line, precept upon precept, that success will be achieved.

But of what can our diabetics die? They are not immortal. Necessarily more will die of cancer, although that is not an enviable end result of a faithful diabetic life. Perhaps it should be less common with diabetics than with non-diabetics, because in diabetics under close observation earlier diagnoses should be made and in consequence more cures should be expected. Unfortunately more are dying of tuberculosis and the attention of our readers is called to the series of articles beginning in this number on this new diabetic menace which was the old diabetic menace of the last century. It appears that now tuberculosis in diabetics is two to three times as frequent as in non-diabetics, that it is ten times as common in diabetic children, that eight per cent of patients rescued from coma within three years develop it and most unfortunately that tuberculosis in a diabetic is almost never recognized in an early stage. More x-ray films should be taken of diabetic chests, for when the diagnosis of tuberculosis is made reasonably early, the modern diabetic often shows surprising improvement under treatment.

What then is left to the diabetic? Pneumonia, the old man's friend, and arterial changes chiefly in the heart and brain which often are sudden and not seldom painless. Indeed, the latter are the complications to which the oldest inhabitants in our midst usually succumb. The diabetic's aim should be to avoid their premature development and so attain a ripe old age. Actually this is being accomplished because now the average diabetic age at death is about 63 years instead of 44 years, the average age at death of diabetics prior to 1915.

PAGE THE SPECIALIST IN FRACTURES!

ON December 1, 1933 there was reported in the *Waltham News-Tribune*, an accident of which the scene was not mentioned. Doubtless it will be brought to the attention of the proper authorities for investigation but it is easily ascertained that a fracture of a sort had been sustained. Exceeding the speed limit was the cause.

The notice in the newspaper reads as follows: "*Middlesex College Notes*—The results of the May examination given by the Massachusetts Board of Registration in Medicine published this week in the *American Medical Journal* showed that more graduates of the Middlesex College of Medicine and Surgery than of any other medical college in the country were successful in passing the examination for licensure in this state."

Careful search for the *American Medical Journal* fails to disclose a copy, but in the *Journal of the American Medical Association* for November 25, 1933, under the heading "Massachusetts May Examination" are published some figures which are probably what the reporter for

the *News-Tribune* had in mind. These figures reveal the truth before the accident, and there was found a similar portrait, full length, in the archives, in an obscure and little known publication, marked Public Document 56, otherwise known as the Annual Report of the Board of Registration in Medicine.

In the *Journal* there appears also a list of candidates, registered by "endorsement." It is a misleading term because each such candidate has the following notation, "Endorsement of the National Board of Medical Examiners."

Turning to the Massachusetts statute one finds that "In determining the qualifications necessary for registration as a qualified physician, the board may at its discretion accept the certificate of the National Board of Medical Examiners of the United States chartered under the laws of the District of Columbia in place of and as equivalent to its own professional examination." Such candidates are therefore licensed by "passing the examination for licensure in this state", and the statement in the *News-Tribune* is not quite true.

The "whole truth", unfractured, as noted in the *Journal*, so far as it can be put down in figures is that of twenty-five graduates of Middlesex who took the examination given by the Massachusetts Board in May 1933, nineteen were rejected and six were registered, of seven Tufts graduates who took this examination, two were rejected and five were registered, of five Harvard graduates who took this examination not one was rejected and five were registered, and several National Board diplomates also were registered. If one does not reckon in these diplomates, about four-fifths of the Middlesex graduates were rejected, one-third of the Tufts graduates and none of the Harvard graduates. In May 1933, more graduates from Middlesex College of Medicine and Surgery were rejected by the Massachusetts Board of Registration in Medicine than from any other of the twenty-eight medical schools whose graduates came before the Board, even more than all the osteopaths who failed to become registered.

But there are the National Board diplomates. The figures for the period covered by the May examination, the dates of which do not coincide with the dates given in the *Journal*, have been secured through the courtesy of the Board of Registration in Medicine and are as follows: Harvard 11, Tufts 4, Middlesex 0. The graduates of Middlesex are not eligible to take the examination given by the National Board. Therefore on this basis the figures are Harvard 16, Tufts 9, Middlesex 6.

In the month of May 1933, of diplomates of the National Board, there were registered five graduates of Harvard, one graduate of Tufts

and again none from Middlesex. The score is Harvard 10, Tufts 6, Middlesex 6.

This study does not indicate the scene of accident, whether in Waltham or in some other place, but it shows precisely the seat of fracture.

It is to be regretted that there should be circulated in the press misleading and inaccurate reports about a medical school which has been chartered by the Commonwealth of Massachusetts even though the graduates of this school are not eligible to take the examination of the National Board, and are reported to be ineligible in every state outside of Massachusetts to take examination for license to practice medicine.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

ROOT, HOWARD F. A.B., M.D. Harvard University Medical School 1919. Physician, New England Deaconess Hospital. Assistant in Medicine, Courses for Graduates, Harvard Medical School. His subject is "The Association of Diabetes and Tuberculosis. Epidemiology, Pathology, Treatment, and Prognosis." Page 1. Address 81 Bay State Road, Boston.

NISSEN, H. ARCHIBALD. A.B., M.D. Harvard University Medical School 1916. Assistant Physician, Robert B. Brigham Hospital. Member of the Staff and Visiting Physician, New England Deaconess Hospital. Assistant Physician, Palmer Memorial Hospital. Former Instructor in Medicine, Harvard Medical School. Address 205 Beacon Street, Boston. Associated with him is

SPENCER, K. A. Survey Executive, Robert Brigham Hospital, Boston. Address 61 West Street, Boston. Their subject is "Sugar Tolerance in the Arthritic." Page 13.

WHITE, PAUL D. A.B., M.D. Harvard University Medical School 1911. Physician, Massachusetts General Hospital. Assistant Professor of Medicine, Harvard Medical School. His subject is "Cardiovascular Review for 1932." Page 20. Address Massachusetts General Hospital, Boston.

The Massachusetts Medical Society

POSTGRADUATE INSTRUCTION

SCHEDULE FOR DISTRICT MEDICAL SOCIETIES

The Executive Committee has arranged the following schedule for the completion of the postgraduate extension courses for 1933 and 1934.

Barnstable

(Hvanni on Sundays at 4 00 P M)

Date Course

- 14 1934—No 5—Acute Infections
- 21 1934 — No 8 — Medical and Surgical Emergencies
- 28 1934—No 2—Vascular Disease
- 4, 1934—No 1—Practical Medical Principles for Everyday Use
- 11, 1934—No 3—Gastro-Intestinal Disease
- 18 1934—No 15—Endocrinology
- 25 1934—No 18—Vaccine Therapy
- 4, 1934 — No 4—Gastro-Intestinal Disease
- 11, 1934—No 19—Arthritis
- 18 1934—No 11—Problems of Infancy and Childhood

Bristol Nor't

Sturdy Hospital on 2nd and 4th Tuesdays of January and 1st and 3rd Tuesdays of other months at 3 00 P M Nurses Lecture Room)

- 9 1934—No 1—Practical Medical Principles for Everyday Use
- 23 1934—No 2—Vascular Disease
- 6, 1934—No 3—Gastro-Intestinal Disease (A)
- 20 1934—No 4—Gastro-Intestinal Disease (B)
- 6 1934—No 5—Acute Infections
- 20 1934 — No 8 — Medical and Surgical Emergencies
- 13, 1934—No 10—Pathological Pregnancy
- 17, 1934—No 14—Syphilis and Dermatology
- 1 1934—No 15—Endocrinology
- 15, 1934—No 19—Arthritis

Bristol North

Morton Hospital on Thursday of each week at 7 30 P M)

- 11 1934—No 1—Practical Medical Principles for Everyday Use
- 18 1934—No 2—Vascular Disease
- 25, 1934—No 3—Gastro-Intestinal Disease (A)
- 1, 1934—No 4—Gastro-Intestinal Disease (B)
- 8 1934—No 5—Acute Infections
- 15 1934 — No 8 — Medical and Surgical Emergencies
- 1 1934—No 10—Pathological Pregnancy
- 8, 1934—No 11 — Problems of Infancy and Childhood.
- 15 1934—No 15—Endocrinology
- 22 1934—No 19—Arthritis

Bristol South

Fall River—Truesdale Hospital on Wednesday of each week at 4 00 P.M.)

- January 10, 1934—No 1—Practical Medical Principles for Everyday Use
- January 17, 1934—No 2—Vascular Disease
- January 24, 1934 — No 3—Gastro-Intestinal Disease (A)
- January 31, 1934 — No 4—Gastro-Intestinal Disease (B)
- February 7, 1934—No 5—Acute Infections
- February 14, 1934—No 6—Diseases of the Blood and Hematopoietic System.
- February 21, 1934—No 15—Endocrinology
- February 28 1934—No 18—Vaccine Therapy
- March 7 1934—No 19—Arthritis
- March 14, 1934—No 22—Diabetes and Vitamins

Bristol South

(New Bedford—St. Luke's Hospital on Friday of each week at 4 00 P M)

- January 12 1934—No 1—Practical Medical Principles for Everyday Use
- January 19 1934—No 2—Vascular Disease
- January 26, 1934—No 3—Gastro-Intestinal Disease (A)
- February 2 1934—No 11—Problems of Infancy and Childhood
- February 9, 1934—No 5—Acute Infections
- February 16 1934 — No 8 — Medical and Surgical Emergencies
- February 23, 1934—No 10—Pathological Pregnancy
- March 2, 1934 — No 4—Gastro-Intestinal Disease (B)
- March 9 1934—No 15—Endocrinology
- March 16, 1934—No 19—Arthritis

Essex South

(Salem on Tuesday of each week at 4 00 P M. Salem Hospital. Auditorium of the Nurses Home)

- January 9 1934—No 4—Gastro-Intestinal Disease (B)
- January 16 1934—No 6—Diseases of the Blood and Hematopoietic System
- January 23, 1934 — No 8 — Medical and Surgical Emergencies
- January 30 1934—No 15—Endocrinology
- February 6, 1934—No 19—Arthritis

Franklin

(Greenfield—Franklin County Hospital on Wednesday of each week at 8 00 P.M.)

- January 3 1934—No 18—Vaccine Therapy
- January 10 1934 — No 8 — Medical and Surgical Emergencies
- January 17, 1934—No 4—Gastro-Intestinal Disease (B)
- January 24 1934—No 3—Gastro-Intestinal Disease (A)

Hampden

(Springfield—Thursday of each week at 4 00 P M)
(Holyoke—Thursday of each week at 8 00 P.M.)

- January 11, 1934—No 1—Practical Medical Principles for Everyday Use

January 18, 1934—No 19—Arthritis
 January 25, 1934—No 18—Vaccine Therapy
 February 1, 1934—No 2—Vascular Disease
 February 8, 1934 — No 8 — Medical and Surgical
 Emergencies
 February 15, 1934—No 6—Diseases of the Blood and
 Hematopoietic System
 March 1, 1934—No 4—Gastro Intestinal Disease (B)
 March 8, 1934—No 3—Gastro Intestinal Disease (A)
 March 15, 1934—No 15—Endocrinology
 March 22, 1934—No 5—Acute Infections

Hampshire

(Northampton—Wednesday of each week at 4 15
 P M)

January 10, 1934—No 19—Arthritis
 January 17, 1934—No 18—Vaccine Therapy
 January 24, 1934—No 15—Endocrinology
 January 31, 1934—No 10—Pathological Pregnancy
 February 7, 1934 — No 8 — Medical and Surgical
 Emergencies
 February 14, 1934—No 6—Diseases of the Blood and
 Hematopoietic System
 February 21, 1934—No 5—Acute Infections
 February 28, 1934—No 3—Gastro Intestinal Disease
 (A)
 March 7, 1934—No 2—Vascular Disease
 March 14, 1934—No 1—Practical Medical Princi-
 ples for Everyday Use

Middlesex East

(Melrose—Melrose Hospital on Wednesday of each
 week at 4 00 P M)

January 10, 1934—No 4—Gastro-Intestinal Disease
 (B)
 January 17, 1934—No 11—Problems of Infancy and
 Childhood
 January 24, 1934—No 15—Endocrinology
 January 31, 1934—No 19—Arthritis

Middlesex North

(Lowell—St John's Hospital on Friday of each week
 at 7 00 P M)

January 5, 1934—No 10—Pathological Pregnancy
 January 12, 1934—No 19—Arthritis

Middlesex South

(Cambridge — Cambridge Hospital on Monday of
 each week at 4 30 P M)

January 15, 1934—No 6—Diseases of the Blood and
 Hematopoietic System.
 January 22, 1934—No 8—Medical and Surgical
 Emergencies
 January 29, 1934—No 11—Problems of Infancy and
 Childhood
 February 5, 1934—No 19—Arthritis

Norfolk

(Faulkner Hospital on Monday of each week at
 3 30 P.M)

January 8, 1934 — No 8 — Medical and Surgical
 Emergencies

January 15, 1934—No 5—Acute Infections
 January 22, 1934—No 2—Vascular Disease
 January 29 1934—No 19—Arthritis
 February 5, 1934—No 3—Gastro Intestinal Disease
 (A)
 February 12, 1934—No 4—Gastro-Intestinal Disease
 (B)

Norfolk

(Boston City Hospital—Staff Room on Wednesday
 of each week at 4 00 P M)

January 10, 1934—No 4—Gastro Intestinal Disease
 (B)
 January 17, 1934—No 14—Syphilis and Dermatology
 January 24, 1934—No 11—Problems of Infancy and
 Childhood
 January 31, 1934—No 5—Acute Infections
 February 7, 1934 — No 8 — Medical and Surgical
 Emergencies
 February 14, 1934—No 19—Arthritis

Norfolk

(Norwood — Norwood Hospital on Friday of each
 week at 8 30 P M)

January 12, 1934—No 11—Problems of Infancy and
 Childhood
 January 19, 1934—No 6—Diseases of the Blood and
 Hematopoietic System
 January 26, 1934 — No 8 — Medical and Surgical
 Emergencies
 February 2, 1934—No 4—Gastro-Intestinal Disease
 (B)
 February 9, 1934—No 14—Syphilis and Dermatology
 February 16, 1934—No 19—Arthritis

Norfolk South

(Quincy—Quincy City Hospital on Monday of each
 week at 8 30 P M)

January 8, 1934—No 19—Arthritis
 January 15, 1934—No 15—Endocrinology
 January 22, 1934—No 10—Pathological Pregnancy
 January 29, 1934 — No 8 — Medical and Surgical
 Emergencies
 February 5, 1934—No 3—Gastro Intestinal Disease
 (A)
 February 12, 1934—No 2—Vascular Disease
 February 19, 1934—No 1—Practical Medical Princi-
 ples for Everyday Use
 February 26, 1934—No 4—Gastro Intestinal Disease
 (B)
 March 5, 1934—No 18—Vaccine Therapy
 March 12, 1934—No 5—Acute Infections

Worcester

(Worcester—on Wednesday of each week at 7 30
 P.M)

January 17, 1934—No 3—Gastro-Intestinal Disease
 (A) (Hahnemann Hospital)

January 24 1934—No 18—Vaccine Therapy
January 31, 1934—No 22—Diabetes and Vitamins

Worcester North

(Aver—Aver Hospital on Thursday of each week at
8 00 P M)

January 11, 1934—No 7—Practical Psychiatric Problems

January 18, 1934—No 10—Pathological Pregnancy

January 25 1934—No 15—Endocrinology

February 1, 1934—No 2—Vascular Disease

February 8, 1934—No 19—Arthritis

February 15, 1934—No 20—Genito-Urinary Disease

March 1, 1934—No 8—Medical and Surgical Emergencies

March 8, 1934—No 5—Acute Infections

March 15, 1934—No 11—Problems of Infancy and Childhood

March 22, 1934—No 1—Practical Medical Principles for Everyday Use

MISCELLANY

AN ARTIFICIAL ESOPHAGUS

Those who were privileged to hear and see Professor G Grey Turner of Newcastle upon Tyne when he lectured before the Massachusetts Medical Society in 1931 will be especially pleased to know that this eminent surgeon has succeeded in providing a passage from the upper portion of the esophagus to the stomach after removing a considerable length of the esophagus for cancer of that organ

This artificial passage, according to the report was made by utilizing the skin of the chest to form a tube which through an opening in the neck was joined to the esophagus above and, by utilizing a loop of intestine to the stomach below through which food could be swallowed

The series of plastic operations needed to establish the communication covered several months and the patient enjoyed the food that was eaten and passed through this detour This successful series of operations shows that human ingenuity and a coöperative patient indicate that further triumphs of surgery are possible to well trained and devoted scientists in this field.

RESOLUTIONS RESPECTING AN ARTICLE BY DR. MORRIS FISHBEIN

At a meeting of the Council of the Chicago Medical Society, November 14, 1933, the following resolution presented by Dr L. E Day was adopted

Whereas Dr Morris Fishbein Editor of the *American Medical Association Journal*, has recently (September 1933) contributed an article on The Costs of High Obstetrical Care to the *American Mercury*, presumably for hire, and

Whereas, in said article Dr Fishbein follows the lead of the irresponsible de Kruif in attacking the Medical Profession for personal profit, and

Whereas, said article makes statements incapable of proof and indefensible as subjects for discussion in the lay press, and

Whereas such derogatory attacks upon the Medical Profession raises (sic) a question as to his fitness for employment by the American Medical Association

Therefore Be It Resolved, that the Council of the Chicago Medical Society deplores the total lack of propriety exhibited in said article and resents Dr Fishbein's disloyalty to the profession which employs him as one of its trusted representatives, and

Be It Further Resolved that this breach of faith be called to the attention of the Board of Trustees of the American Medical Association by sending a copy of these resolutions to the members thereof with the request that proper disciplinary measures be instituted which will make such violations of decency, ethics, morality and common sense impossible in the future—*Bulletin of the Chicago Medical Society*

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

COMMUNICABLE DISEASES AMONG SCHOOL CHILDREN*

BY JAMES A. KEENAN, M.D

It is desirable that the public have some knowledge of the principles of school hygiene in so far as it relates to the control of communicable disease. With this subject in view, we will endeavor to set before you a few relative facts as well as procedures known and generally carried out in school systems throughout the Commonwealth of Massachusetts

Closing of schools in the presence of epidemics of communicable diseases was at one time the only method of protection and control At the present time, this system is resorted to only at a time of an outbreak of a little understood disease

Nearly all of the diseases that affect the school child are now fairly well understood, first, as to the spread of the disease, and secondly, as to the methods to be followed as a means of preventing the spread of infection. In many cases the cause of contagious diseases affecting children is known For instance, medical science has proved that the typhoid bacillus causes typhoid fever, that the Klebs-Loeffler bacillus causes diphtheria, and that a certain strain of the germ known as streptococcus causes scarlet fever, epidemic adenitis, as well as septic sore throat. Other forms of streptococci cause rheumatic fever, acute appendicitis, virulent pneumonia acute seriously disabling endocarditis, or valvular heart disease

The pneumococcus, of which there are at least four identified types cousins so to speak, but all

*Station WBZ November 10 1933

reacting in a slightly different manner when tested, is the cause of pneumonia. The meningococcus, an organism that looks somewhat like a biscuit under the microscope and is very difficult to grow artificially, is the cause of meningitis. If a case of epidemic meningitis occurred in a classroom, all the children in that classroom would be examined for the presence of the meningitis germ which may be found in the back of the nose. This examination is performed by wiping some of the secretions of the back part of the nose with a wire wrapped in sterile cotton and the secretions are planted on a suitable food media where they develop at body temperature and can then be detected. Children showing the presence of meningococcus are excluded from school and isolated to protect other pupils and the public, who may be in such a condition of health as to allow the germ to establish itself and cause the disease.

Scarlet fever can be controlled and can be prevented best by school health authorities. In fact, the schools are largely responsible for the decrease in the virulent type of scarlet fever cases. The disease is now so mild that it is often very difficult for an expert to pronounce some cases as scarlet fever. If there is any doubt as to whether a child has scarlet fever, the mistake, if any, is made on the side of the disease. This is to protect the child from the complications resulting from scarlet fever which are many and varied. Once a case of scarlet fever is discovered, the school physician notifies the Health Department which department is invested with very wide police power and sees to it that the child is isolated for at least twenty-eight days. If there are any discharges from the nose or ears, or from open sores, or if there are enlarged glands, the case is not released by the Health Department until such time as the child is well. Desquamation is not of itself capable of spreading scarlet fever. If the desquamating or peeling skin is contaminated with discharges, it is then dangerous. If a child has had scarlet fever, discharges from the nose or ears may be a source of infection long after a period of six weeks has elapsed. Children, even though they appear well, may spread the disease through such discharges. When a child who has been absent after an attack of scarlet fever returns to school, he is examined by the school physician before he is allowed to enter the classroom. If any discharges from the nose, ears, or open sores are present, he is excluded until such time as these conditions disappear. The school authorities of Boston exclude from school all children of the immediate family when a case of scarlet fever occurs in a household for a period of at least seven days after exposure. This is to prevent the spreading of the disease in other classrooms. Children who have had scarlet fever or who react negatively to the Dick test and who are later exposed to the disease are not excluded from school. A well child from a household where a case of scarlet fever is quarantined by the Health De-

partment and who has not had the disease is not allowed to attend school for the full period of quarantine, that is, for at least twenty-eight days. If the case is isolated in a hospital, or if the children of the household who are not immune are transferred to the household of a relative or friend, the exposed children are allowed to attend school after a period of seven days has elapsed from the time of such exposure. This rule alone has, in some schools, cut the number of cases of scarlet fever from fifty to seventy-five per cent. Without school medical inspection and supervision, scarlet fever would be uncontrolled.

Scarlet fever always increases with the advent of the cold weather whether the schools are open or not. Without school medical inspection, nobody would know how much scarlet fever was prevalent, many cases would never be quarantined, there would be a serious spread of the disease, and many more children would be allowed to suffer from a very serious disease, the after-effects of which would in all probability cause grave injury. Everybody knows that scarlet fever cases require three weeks in bed in order to avoid serious complications. Therefore, the discovery of a case of missed scarlet fever in a school child is a very valuable aid in preserving and conserving the child's health.

Measles is a disease occurring commonly among school children. It is one of the most contagious diseases known to man. No person is immune to the disease, young or old, all races are affected in all climates. Measles is a problem in the schools only among the younger children in the kindergarten and first grades. It is a very serious disease unless good medical attention and excellent nursing aid are enlisted. It is possible to detect measles in its early stages. Inside the mouth on the cheek surface appear tiny white spots with a red base. They look somewhat like grains of salt. These spots are often present before the child shows any suggestive signs of measles. When a case of measles is known to have occurred in a classroom, the school physician examines the other exposed children at the end of eight days to detect the presence or absence of these spots. These inspections are carried on for three days. If these spots indicative of measles are found, the children so affected are recommended for exclusion by the school physician and a note is sent to the parent stating that the child presents symptoms suggestive of measles. This method forewarns the mother, allows her to procure adequate medical care and nursing and minimizes the attack thus conserving the child's health. If these spots are found early enough exclusion prevents the other school children from contracting the disease. The reason that inspections of pupils in close contact with measles cases are made by school physicians eight days after exposure to the disease is because it takes from ten to fourteen days from the date the child has been exposed to measles to the date

the disease manifests itself. It can be seen that a scientific knowledge of measles applied can prevent the spread of the disease as well as most happily preventing serious after-effects and modifying the character of the disease when it does occur to a milder form.

If an outbreak of smallpox should occur the public schools would be the only place where an epidemiologist (a person concerned with the discovery and prevention of disease) could obtain extremely valuable information. Every school child's vaccination history is kept on file and the date of vaccination is always available on the school record card.

Mumps is a disease that may manifest itself twenty-one days after a child has had close contact with a person suffering from this illness. This is the reason that all children from a household where a case of mumps occurs are excluded for twenty-one days. If allowed to return to school earlier, they may develop the disease and thus expose many other children to mumps.

Chicken pox is an acute infectious disease, extremely contagious, commonly occurring in children of school age. The disease usually does very little damage to the human system and is important only in that it may be confused with mild smallpox which disease it resembles very closely. The trained school physician can readily differentiate the diseases smallpox and chicken pox thus enabling us to minimize the incidence of chicken pox, and through the practice of vaccination prevent smallpox from occurring.

German measles occurs occasionally in epidemic form among school children. The disease is relatively unimportant usually running a mild uncomplicated course. It is frequently confused with scarlet fever as the rash of a mild case of scarlet fever closely resembles the rash of German measles.

Diphtheria is a disease that usually establishes itself in the throat or in the nose. Due to the campaign carried on in the Boston public schools against diphtheria, principally by the injections with toxin antitoxin this disease has been almost banished from our school systems.

Schools are therefore, kept open in times of epidemic because medical science can be applied systematically and universally to the end that the occurrence of communicable diseases among school children may be minimized.

RESOLUTIONS ADOPTED AT THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN SOCIETY OF CLINICAL PATHOLOGY*

As a definite program for our membership in its public relations we would recommend

- (1) The continued maintenance of the highest professional standards in our own work

*Part of the report of the Committee on Public Relations of the American Society of Clinical Pathology as it appeared in the *American Journal of Clinical Pathology* Vol 3 No 5 September 1933

- (2) The wise use of our influence to encourage legislation which will help preserve efficient laboratory service for the medical profession.
- (3) Wider contacts between our members and other physicians to the end that they as our associates may know that as medical consultants and laboratory directors we are worthy of our hire
- (4) Active cooperation with all attempts to furnish more accurate tissue diagnosis
- (5) An official offer of cooperation by this Society in any organized plan for adjusting the economic side of medical care to the national budget.

RESOLUTIONS CONCERNING STATE LABORATORIES

Whereas, It is the recognized purpose of the Boards of Health of the various States to conserve the public health by measures for the prevention and control of communicable diseases, and

Whereas Laboratories under the direction of many State Boards of Health have extended their activities beyond this field for various reasons and

Whereas, It is believed that the welfare of the public and of the medical profession will be best conserved if the activities of Public Health Laboratories are confined to measures for the prevention and regulation of communicable diseases, and to laboratory service for the indigent sick and for legal wards of the State

Be It Resolved That two propositions be recommended for the consideration of State Medical Societies

- 1 That the furnishing of general diagnostic service by State Laboratories tends to prepare the public conscience for the acceptance of added varieties of State medical practice

- 2 That while the cost of true public health laboratory service is a legitimate governmental expense, the extension of this service into the field of general laboratory diagnosis is an unnecessary and unwarranted burden upon the taxpayers of the State

These two points for criticism in the State Laboratory situation are very apparent in clinical pathologists and are worthy of consideration by the entire medical profession. It is unwise to ask the State to practice medicine in the laboratory unless we are willing for it to spend still more public money and practice medicine in the ward and in the operating room.

The State Medical Societies can and we believe they should exert a powerful influence in keeping the demands made upon State Laboratories within the limits of truly public health functions. The Societies also can encourage the State Boards of Health to keep general diagnostic work out of their laboratories by regulation, and to inquire that each specimen from an indigent patient be accompanied by a card signed by both physician and patient. On this card the patient shall state "I declare on my honor that I am financially unable to pay for this laboratory test and I know that the State Labora

tory makes no charge for acid tests" The physician's statement shall read "I state, on my honor, that this patient is financially unable to pay, and that I am making no charge for my services to this patient"

C W MAYNARD, *Chairman*

Motion made and seconded for acceptance of report Carried

It was further moved and seconded that a copy of this report be sent to each Counsellor of the Society, the American Medical Association, the American Surgeons, American College of Physicians, Secretaries of the State Boards of Health and Directors of the State Boards of Health Carried

Moved and seconded that a letter be sent to the Presidents and Secretaries of the State Boards of Health who have contributed by their recent actions in the movement to withdraw services in the general field of clinical pathology and have attempted to restrict their activities to strictly public health problems Carried

RECENT DEATHS

CHURCH — LUCY BARNEY HALL CHURCH, M D, a retired physician of Dedham, Massachusetts, died December 28, 1933 She was born in 1866 and graduated from the Boston University School of Medicine in 1893

She was active during the World War as a lecturer on social hygiene She is survived by E Norman Church, husband by her second marriage A son by her first marriage, Fred Cahill Hall, served overseas

POLLOCK — JACOB T POLLOCK, M D, of Chelsea, Massachusetts, died December 28, 1933 He was born in Russia in 1889 He graduated from the College of Physicians and Surgeons of Boston in 1913

He is survived by a brother, Samuel Pollock, and three sisters, Mrs Sarah Matzkin, Mrs Dora Batzkoff and Mrs Beatrice Gesson

MAYNE — JAMES ELMO MAYNE, M D, died at the Winchester (Massachusetts) Hospital December 25, 1933, of pneumonia

Dr Mayne was born in Drayton, Ontario, in 1901, the son of James and Sophronia Mayne He graduated in medicine from the University of Toronto Faculty of Medicine in 1926 and joined the Massachusetts Medical Society in 1932

He was also a Fellow of the American Medical Association He served as intern at St. Michael's Hospital, Toronto, and the Williamsport Hospital, Pa, and later on the staff of the McLean Hospital in Waverley, and the Ring Sanatorium and Hospital in Arlington

Previous to his death he was practicing in Winchester He is survived by his mother and two brothers Interment was at St. Martin's cemetery, Drayton, Ontario

HILLS — WILLIAM BARKER HILLS M D, of Montclair, New Jersey, died December 24, 1933, at the age of 83 years He graduated from the Harvard Medical School in 1874 and was associate professor of Chemistry at the Harvard Medical School for many years up to 1904 The title of professor emeritus was later conferred upon him

After leaving the medical school, he had charge of the chemical laboratories of the New England Mutual Life Insurance Company of Boston, until he retired in 1927 He was a member of the Massachusetts Medical Society from 1874 until he retired in 1915 He is survived by his widow, Miss Carrie M (Sleeper) Hills, and a daughter

SHURTLEFF — WALTER D SHURTLEFF, M D, of Plymouth, Massachusetts, died in that town at the Jordan Hospital, December 24, 1933

He was born in Washington, D C, and received his M D degree from Howard University School of Medicine of Washington.

Before moving to Plymouth, he practiced in Kingston He joined the Massachusetts Medical Society in 1899 His membership was terminated in 1910

He is survived by his widow, a daughter, Miss Flora Shurtleff, two sons, Albert H. Shurtleff of Plymouth, and F Lebaron Shurtleff of New York.

NOTICES

COURSE ON MEDICAL BIBLIOGRAPHY

BOSTON MEDICAL LIBRARY
1934

- January 9 Introduction Dr C F Painter
 - January 19 Sources of Information James F Ballard
 - January 23 Sources of Information James F Ballard
 - January 30 How to Go about the Investigation of a Medical Subject. Dr W C Quinby
 - February 6 The Making of Medical Books Dr Henry Viets
 - February 15 Incunabula James F Ballard
- Tuesdays at 8 P M except for the second meeting which will be on Friday, January 19
Boston Medical Library,
8 The Fenway

ANNOUNCEMENTS

- HELEN SINCLAIR PITTMAN, M D, announces the removal of her office to 412 Beacon Street, Boston
- FRED FINKLE, M D, announces the removal of his office to 37 Columbia Road, Dorchester, Mass
- ROY E MABREY, M D, announces his association with E A. Codman, M D at 227 Beacon Street, Boston

REPORTS AND NOTICES OF MEETINGS

THE PHYSICIANS ALLIANCE

The regular meeting of the Physicians Alliance took place on Thursday, October 26 1933, at 8 30 P M at the Whittier Street Health Unit, Roxbury

Dr Henry M Landesman, Chairman, discussed the purposes and plans of the Physicians Alliance He stated that this society was interested only in the economic welfare of the physicians and that it intended to coöperate in every way with the local district, state and national organizations He felt that certain things should be worked out and presented to the other organizations so that speedy action could be attained

The economic conditions of the physician have been undergoing a change to the detriment of the physician for several years The depression naturally made things worse but the fundamental trouble was not improving but getting still worse that the public due to the tolerance genuine kindness honest philanthropy, and poor business ability of the physician were taking advantage of and abusing the generosity and the humanitarian principles of the physician and were getting something for nothing If the physicians were earning a living they would still continue as heretofore but now, since a living is being denied them, they are forced with their backs to the wall to come out to battle for fair play When among these fine men and women some are forced by exigencies and circumstances to apply for aid to prevent the possibility of being put out of their offices and homes and to prevent their families from starving, it is but natural and human for us to get together and obliterate the underlying causes of the situation

"The physician is always ready to help the indigent and the poor but those in comfortable circumstances must be made by explanation and even shame to pay The physician, during the past decade, has made tremendous progress in teaching the public preventive medicine Physicians now rarely see cases of typhoid, diphtheria, smallpox malaria, dysentery, and other diseases which used to provide a great deal of practice and yet the public is unappreciative of the elimination of the pain, suffering and cost We ask for no favors, only for fair play We must be able to meet our expenses

"We, therefore hope that by bringing the various abuses of the public to the physician and the hospital and of some hospitals to the physician to an honest discussion among ourselves we will be able to eliminate those practices that are harmful

The guest speaker for this evening is a physician whom you all know, who has shown his mettle and ability in the various positions which he has held previously at Harvard Medical School and then at the Crile Clinic in Cleveland, Ohio and who is now holding the foremost position in the country, successor to the world's greatest brain surgeon, Dr

Harvey Cushing, — the Moseley Professorship of Surgery at the Harvard Medical School, and Surgeon in Chief of Peter Bent Brigham Hospital, Dr Elliott C Cutler, who will read a paper on the 'Relation of the Physician to the Hospital Out Patient Department.'"

THE RELATION OF THE PHYSICIAN TO THE HOSPITAL OUT-PATIENT DEPARTMENT*

BY ELLIOTT C CUTLER, M D

Members of the Physicians' Alliance I am very grateful to you for being allowed to meet you tonight. Perhaps the busy practitioner does not realize how much those people whose lives are confined largely to hospital practice delight to get out now and then and meet their colleagues under such circumstances

Your problem, and the topic of this evening's meeting, 'The Relation of the Physician to the Hospital Out Patient Department' is part of the general economic situation of today I personally do not believe that the present financial situation has brought anything new into medical practice It is only that the pinch of our present depression has focussed our minds on the general trends of modern medical practice, trends which have year by year encroached upon the province of the general practitioner of medicine State medicine, state sanatoria for tuberculosis and cancer in addition to increased public health measures, and the increasing tendency for all forms of health insurance in addition to accident cases, have gradually taken away from the regular practitioner a large part of his work. At the same time that this has been going on nurses have been better educated and by being better able to help doctors have made it possible for fewer doctors to care for more people And always we have continued to turn out in this country more doctors than the people need'

The financial depression of today has emphasized these changes and we now see clearly the results of what has really been going on for many years To this extent the present financial difficulty is of benefit and should allow us to crystallize out of the welter of criticisms and suggestions what is best for the progress of modern medical practice It is obvious that there will be changes One of these must be the reduction in the number of new doctors, and could some of those who are urging larger classes in medical schools be here tonight, they would visualize a dilemma which their desires may well make worse

The topic of tonight is really incomplete in that it should be the relation of hospitals to the practitioners of medicine, for there are two distinct phases in this possibility that hospitals may be taking practice away from the general practitioners The first phase has to do with patients consulting hospital dispensaries who might possibly afford to go to a doctor and the second phase has to do with

*Read before The Physicians Alliance Boston October 26 1933

Page No 53 - 69 not missing

the hospitals continuing to carry patients, referred to them by a doctor, in their dispensaries rather than returning those patients to the physician. Before speaking tonight of the immediate situation with which I am familiar here in Boston, i.e., the relation of the Peter Bent Brigham Hospital to the practitioner, I wish to recall to you that I went through a much more serious economic difficulty in Cleveland where the depression has been far more deeply felt. The same situation there, only more intense and engendering a bitterness not seen here tonight, reached such a pitch that it was finally agreed that patients would not be admitted to hospital dispensaries except when referred by a doctor. This rule both protected the hospitals, which found they could not carry the load financially, and possibly eased somewhat the practitioners' situation. But many evils resulted from such an arbitrary ruling. It was soon found that doctors were accepting small payments just to give a patient a letter saying that he could go to a dispensary and receive free care. Moreover, certain patients preferred the hospital service and objected to any infringement of their rights to choose their own medical advice.

Now I should like to discuss the matter of this evening in relation to the Brigham Hospital. When the patient comes to the dispensary, every attempt is made to find out whether he has a physician. If we can determine who the physician is, we write to him at once and receive his opinion as to whether we should treat the patient or send the patient back to him. We also enquire at this time what it is he thinks should be investigated in his patient. If no doctor can be located, the social service department tries to determine the financial status of the individual. We have to accept the patient's word as to his income and job, for a more elaborate survey of every individual's financial status would be too great a burden for us. As a matter of interest, previous investigation has already determined that only about two per cent of people lie about this at the hospital admitting offices. Probably, therefore, it would not be financially worthwhile to carry investigations further. It is true that from time to time patients' statements as to their employment are checked up. When patients are found to have an income above the limit set by hospital administrators as suitable for dispensary care, they are refused treatment in the Peter Bent Brigham Hospital Out Door Department.

The second phase of the problem has to do with the admission of patients to the hospital. On the medical service when a patient is admitted, a card is sent to the referring doctor, asking him to come on ward rounds and see the patient with the hospital staff. On the surgical service, pre-operative contacts are attempted and always the recommending physician is notified of the day and time of the operation. Doctors who accept these invitations probably never lose their patients for a part of the loss of the practitioner's patients when his clientele enter a

hospital is due to the fact that during this period of hospitalization he does not continue to take an active interest in his cases. Upon the discharge of patients from the hospital, a summary note of what happened to the patient is sent to the referring physician and we try to refer all cases back to the doctor who sent the case to the hospital. Unquestionably, slips occur in this custom, but they are not very frequent and we constantly check back into this matter. It is true that in surgery we run a follow up clinic and ask patients to come back from time to time to check up on their end results. But these follow up examinations have nothing to do with the dispensary itself and are merely that we may determine the efficacy of the treatment we give. In order that cards to patients asking for follow up examinations may not be misconstrued, we are now sending out notices to the patients' physicians whenever such an end result examination is asked for so that they may fully appreciate that this examination is without fee and is not for therapy.

These are the protections with which we try to surround ourselves so that the practitioner may feel we are in the community to help him as best we may. You must remember that the people in charge of the large hospitals are vitally interested in your good will. They know that their hospital cannot be successful unless you have faith in it. We have, therefore, the most forceful reasons for doing everything we can to retain your good wishes.

With this statement it must appear to you that the hospital is not in any competition for practice with the general practitioner of medicine. Indeed it is really there for your benefit and I am certain that none of you would prefer to work in a community where there was not a good hospital. The hospitals may make mistakes and possibly some of these can be avoidable by modification of the system of admission in some hospitals, but if the outline which we follow at the Brigham Hospital is carried out as carefully as possible, there will be the minimum of such mistakes.

Dr Irving J. Walker, Clinical Professor of Surgery, Harvard Medical School and Surgeon in Chief of the Fifth Surgical Service, Boston City Hospital, discussed the paper as follows:

I am very glad to be with you tonight to discuss this very interesting subject. It is quite natural for human nature to endeavor to get something for nothing, or for as little cost as possible. This applies to medicine as well as to other aspects of life.

While I am a member of the Staff of the Boston City Hospital, I do not, of course, represent the Staff or the Administration in my statements.

I quite agree with all that has been said regarding the abuse of the charitable hospitals in and about Boston by those people able to pay for medical services. It may be possible that the Boston City Hospital is one of the chief offenders in this abuse. At times I am personally rather upset when I see

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CANCER OF THE STOMACH

BY FRANK H. LAHEY, M.D.,* AND SARA M. JORDAN, M.D.*

IT is a grim paradox that the most serious disease of the stomach, carcinoma, is usually the least blatant in its onset. While the benign ulcer makes its appearance with very definite symptoms, sometimes even with the dramatic symptoms of hemorrhage or perforation, and with a fully developed x-ray deformity which Cole states has its full size when first seen and has never been known to grow larger under observation, the malignant lesions of the stomach, especially the carcinoma, are characterized by an insidious inception which is often considered clinically negligible.

This early clinically latent period of the disease, as in cancer of all organs, is, of course, the stage at which its detection offers an opportunity for the greatest chance of safety from recurrence, and with this fact in mind, the internist, the radiologist, and the surgeon are united in a very serious effort to diagnose and treat the lesion at this incipient stage.

There are three types of data which have informative value in the diagnosis of cancer of the stomach after it has passed beyond the incipient into the well-developed stage. These may be briefly summarized as follows: first, the history of loss of appetite, loss of weight, and epigastric distress; secondly, the physical examination which shows a pale individual with evident recent loss of weight, and with a mass in the epigastrium or left upper quadrant, and finally, the laboratory data demonstrating an achlorhydria or a hypochlorhydria, an anemia, occult blood in the stools, and radiologically, a distorted contour of the stomach. When a combination of these three types of diagnostic data is presented, there remains no doubt as to the diagnosis, and the only matter to be decided is the operability of the lesion. Such a lesion has developed far beyond the quiescent stage of inception.

The earlier stage, unlike the later unmistakably obvious one, shows symptoms which are unfortunately often considered of no significance by both patient and physician. The history which is later so typical may at first be very indefinite, suggesting perhaps the most transient type of indigestion, there may yet be little or no loss of weight and no anemia, there may still be free hydrochloric acid in the stomach not far

below the normal amount, and finally, the x-ray may be only faintly suggestive of an organic lesion or may definitely suggest a benign ulcer. It is this early stage of cancer of the stomach which at once offers the most perplexing problems in diagnosis, and the greatest hope for cure with surgical removal.

Since there is no revealed method of prophylaxis against cancer of the stomach, the three considerations of practical interest at present are (1) whether once the disease has begun its course, removal at any stage, even the incipient one, is worthwhile, and (2) with the assumption that removal of the early lesion increases life expectancy and the comfort of the patient, what measures can be taken to increase the percentage of early diagnosis, and (3) what surgical measures can be used to insure the longest period of freedom from recurrence.

The medical profession as well as the laity are frequently impressed and also depressed by the apparent hopelessness of the situation with regard to cancer of the stomach when it attacks their own patients or their own friends. The difficulties in evaluating symptoms and differentiating the insignificant and the ominous ones are discussed, and the conclusion not infrequently reached, perhaps with consolatory or condonative implication, that even if an early diagnosis had been made, in such a rapidly metastatic disease not much is gained by removal of the lesion itself.

A recent study of 168 cases of cancer of the stomach in our Clinic was made in an effort to determine the character of the symptoms, their duration, the relation of duration of symptoms to the prognosis, and the effect of early removal upon life expectancy.

These 168 cases of cancer of the stomach were classified as follows into four groups: the first of 56 cases, those whose lesion was of such a character, or whose diagnosis was made early enough, so that the lesion could be removed by partial or total gastrectomy.

The second group of 30 cases, those in whom only palliative changes in the course of the alimentary stream could be made, i.e., by gastrostomy, by gastro-enterostomy, by jejunostomy.

The third group of 32 cases, those in whom only exploration could be done.

*Lahey—Director, Lahey Clinic. Jordan—Gastroenterologist, Lahey Clinic. For records and addresses of authors see "This Week's Issue" page 109.

The fourth group of 50 cases, those in whom no operation was considered advisable

It was felt that these four groups represented roughly four stages in the development of the lesion, graduated from the entirely operable to the entirely inoperable stage, and it was thought that some interesting and possibly some informative deductions might be made from an analysis and comparison of the following data in these four groups of cases

- (1) The ages of the patients
- (2) The duration of the symptoms
- (3) The chief complaints
- (4) The duration of life after the diagnosis was made

The general impression that the cancer age is from 40 to 70 years was found to be almost true in this study of cancer of the stomach, since the greatest incidence (54%) was found in the ages of 40 to 59 years, and 35 per cent were between 60 and 70 years. However, it was of interest to note that ten cases or six per cent were between 30 and 39 years, a sufficiently large incidence to make it necessary for the clinician to think of cancer in the patient of the fourth decade who complains of indigestion. Another point of interest in studying the ages of patients in the four groups described above, is that the ratio of patients under 50 years to those over 50 years, is as $\frac{1}{2}$ to 1 in the presumably early stage group, that in which the lesion could be removed, while this ratio changes to $\frac{1}{3}$ to 1 in Groups II and III where palliative or exploratory operation only could be done, and to $\frac{1}{5}$ to 1 in those considered entirely inoperable. In other words, a relatively younger group sought help in a stage where the lesion could be removed. In certain cases, this probably indicates that the greater age was a contraindication to operation, but it probably means, at least to some degree, that the younger person heeds his symptoms at an earlier stage.

The second point of interest in this comparative study, was the importance of duration of symptoms, a subject usually considered vital by all who refuse to be fatalistic in the matter of cancer of the stomach. It is generally assumed that the length of the history indicates the progress of the lesion, though consideration of two other factors must not be neglected: first, the varying degree of sensitivity to discomfort found in different individuals, and this is usually associated with accuracy of memory of such discomfort, and therefore leads to different degrees of veracity in the relating of the history; secondly, the varying degree of malignancy in the lesion and the reaction of the individual to it. However, in spite of these uncontrollable variants, the length of the period of time between the moment when the patient is first conscious of something wrong and the moment when the diagnosis of cancer of the stomach is made, is a matter of serious consideration.

A study of this phase of the subject in these four groups of cases of carcinoma of the stomach resulted in the following data. In the 53 cases of presumably earlier stage lesions, 32 or 60 per cent had a history of six months or less, while 21 or 35 per cent had a history of over six months. However, in the next two groups representing those with palliative or exploratory operations, and therefore presumably later stage lesions, 61 per cent had a history of six months or less. The totally inoperable cases, however, did show a fewer number of cases with short histories (six months or less), namely, 51 per cent.

The very short history of two months or three months, however, which might by the casual observer be thought to indicate an early stage, was found equally as often in the presumably late stage group as in the presumably early stage group. It seems fair to conclude from this phase of the study that, although the length of history has some prognostic significance, this is less important than would seem logical, a fact which is possibly due to the uncontrollable variants previously mentioned.

The third point of interest was the character of the chief complaints. There are two facts about cancer of the stomach which are also facts about almost any other gastro-intestinal disease: the first, that it may come to the attention of the patient only by general symptoms which point toward trouble in the alimentary tube, but give no clue as to the exact location of this trouble, e.g., abdominal distention, the second, that directly misleading symptoms may occur which, unless followed by careful study, lead to an erroneous diagnosis, e.g., constipation or diarrhoea. It was felt that by a study of the complaints in the various groups of cases, a differentiation might be made of those found in early lesions and those in later lesions. While such was not the case, it was found that the classical symptoms of alarming import, namely, loss of weight and strength and anorexia, were found in increasingly greater incidence with the progress of the lesion, more than twice as frequently in the totally inoperable stage as in the totally operable stage. Furthermore (and this seemed a fact of considerable importance), the symptom of epigastric distress, a chief symptom in the entire series of cancer of the stomach in 42 per cent of cases, was found as chief complaint in more than half of the presumably earlier stage cases, in 43 per cent of those with palliative and exploratory operation, and in only 30 per cent of those considered inoperable. The disquieting fact about these data is that this symptom which in more than half of the cases of cancer of the stomach which were still amenable to treatment, was the chief complaint, is likewise so often the chief complaint in ulcer or gall bladder disease, or a functional disturbance often classified as gastric neurosis, and may often be explained by these relatively innocuous

diagnoses and the actual malignant cause ignored. Another symptom frequently given only casual attention by the physician namely gaseous eructations, was the complaint for which eight of the 160 cases sought help, and three of these eight were in the group with late lesions. Vomiting was found more frequently in the cases that had palliative or exploratory operations, than in the earlier or later groups. Distinctly misleading symptoms, constipation, diarrhoea, and melena were the chief complaints in 12 cases of this series, five of which were in the early group, and seven in the later groups.

The data on the finding of a palpable mass indicated, as was expected, that prognosis as to operability was poorer in the presence of a palpable mass than when there was none. A palpable mass was found in 31 per cent of the early lesions, as compared with 54 per cent of the later ones. A slightly larger number of early cases as compared with later ones had free hydrochloric acid in the gastric contents.

A brief summary of these data concerning the symptomatology of cancer of the stomach in these four groups of cases leads to the conclusion that the character of the symptoms may be heterogeneous, that the textbook syndrome of loss of appetite weight and strength is more commonly found in late lesions than in early ones, and that symptoms characteristic of many other gastro-intestinal lesions and distinctly misleading symptoms may characterize the early lesions.

The fourth point of interest in the comparison of data in these four groups of cases was the question of duration of life after the diagnosis was made. Here the question of the value of early diagnosis must find its answer, which in our opinion was an encouraging one. An attempt to conquer in the struggle against the force of the lesion itself and its potential metastases by a removal of the lesion, presupposes an agreement as to the value of any prolongation of life beyond a time when it would otherwise have been ended by disease. Such an agreement is surely uncontested by therapeutists. The data showed that of 86 cases operated upon and followed 22 of 53 of the first or presumably early group in whom complete removal of the lesion could be done lived more than a year. In striking contrast is the fact that of 33 cases that had palliative operation, only three lived a year. Furthermore, the survival after partial or complete gastrectomy of one case for nine years, of two cases for six years, of one for five years, of two for four years, of one for three years, and two for two years all microscopically proved, offers sufficient encouragement to the surgeon and internist to continue the search for early cancer of the stomach and the complete removal of the lesion.

These conclusions lead to a discussion of the second and third considerations of practical interest which were defined as the purpose of this

paper, namely what measures can be taken to increase the percentage of early diagnosis and what surgical measures can be used to insure the longest period of freedom from recurrence.

It is probably true that if all the diagnostic measures which we possess were intelligently used in all cases of cancer of the stomach in the incipient stage practically none would escape detection. But even those patients who come to the physician with this disease in its early stages may easily be confused with those patients who have an insignificant or a transitory benign lesion. How often does a physician hesitate to urge a complete gastro-intestinal study involving expenditure of time and money, in the case, for example, of a man of 39 presumably not yet in the "cancer age" with a single complaint of gaseous eructations or epigastric distress of only a few weeks' duration, when his symptoms may easily be explained by worry over the stock market, and be cured by dietary care and alkalies. Yet if the duration of life in cancer patients is to be prolonged by early surgery, exhaustive and intelligently executed studies of the alimentary tract must be urged in all patients with gastro-intestinal complaints. The interpretation of the results of these studies must be conservative and careful so that unnecessary surgery will not be done. It is important, for instance, to distinguish in the x-ray findings between an actual lesion and spasm. Pyloric spasm, pyloric constriction due to adhesions, and pyloric constriction due to carcinoma are easily distinguished on actual visualization and palpation of the stomach, but by fluoroscopic and film methods this is often difficult and only possible in certain cases when measures, either drugs or medical treatment, are used to combat the spasm. It may be of interest here to discuss briefly the differentiating points of diagnosis of cancer and ulcer of the stomach. The day has passed when all lesions of the stomach must be operated upon because they occur in a fertile field for cancer. Large and small ulcers of the stomach have been seen to heal under fluoroscopic vision, and this healing has been checked by actual vision and palpation. However, the fact that lesions of the stomach may be differentiated into the benign and the malignant group, puts great responsibility upon the shoulders of the diagnostician. This responsibility can best be met in our opinion by a definite policy upon which dependence can be placed in doubtful cases. The policy of our Clinic in such doubtful cases is to decide pre-operatively whether there is sufficient reasonable evidence for malignancy to make complete surgical removal of the lesion necessary. Pre-operative decisions have been accepted as superior to decisions made during surgical exploration, because the latter have been proved by our experience to be less satisfactory than the former. The early carcinoma may feel and look like an ulcer and more frequently the calloused

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quate relaxation of the abdominal wall so that high anastomoses can with ease and safety be made to short gastric stumps after extensive partial gastrectomy. This is in a considerable measure true even when regional anesthesia is added to either nitrous oxide or ethylene anesthesia.

When spinal anesthesia became popular, as it did a few years ago, it seemed possible that it might well supply ideal operating conditions for gastric resection, particularly in those patients who often fall into the bad risk group. In a considerable experience with this type of anesthesia in operating upon patients who require extensive, lengthy operative procedures, spinal anesthesia has proved disappointing and even dangerous. The disadvantages of spinal anesthesia in patients with upper abdominal lesions requiring prolonged operations are two, one, that a large dose of the drug must be employed in order to prolong the anesthesia as much as possible, two, the anesthesia must be carried fairly high in order to produce loss of sensation well above the operative level. Both of these factors tend to produce marked drops in blood pressure and so increase the danger of the procedure. Another unfavorable factor in the employment of spinal anesthesia in gastric resections is the fact that one cannot be sure how long the anesthesia lasts. Even with large doses of novocain, anesthesia may fail at the end of an hour. After an hour the duration of the anesthesia is always very uncertain. When anesthesia fails in this situation, a general anesthetic must then be given to complete the procedure and to close the abdominal wall. This involves often ether, nitrous oxide or ethylene given so that the patient is carried to considerable depths of anesthesia. At this time, the patient has already been submitted to a quite shocking procedure and the addition of a general anesthetic of sufficient depth to permit the completion of a high anastomosis or closure of the abdominal wall often results in very definite degrees of shock, and so provides features calculated to increase the mortality in these cases.

Since our anesthetists, Dr L F Sise and Dr P D Woodbridge have made use of the present plan of combined avertin, intratracheal ethylene and regional anesthesia, anesthesia conditions for these radical gastric resections have been very much improved.*

The present plan, therefore, is the employment of sixty to ninety milligrams of avertin per kilo of body weight given to the patient while still in her room. On the operating table, patients are placed under ethylene and when well under ethylene by means of the laryngoscope, the intratracheal catheter containing the Waters' Balloon is passed between the vocal cords into the trachea. The balloon on the end

of the catheter is then blown up so that there is a tight fit about the tube in the trachea and the intratracheal catheter is connected with the ethylene apparatus which has attached to it a carbon dioxide extractor. This carbon dioxide extractor, which is similar to that on a basal metabolism apparatus, has also proved of great value in that it keeps the heat and moisture within the closed circuit, it extracts carbon dioxide so that it is not being returned to the patient to produce the stertorous type of respiration, and, in addition, markedly diminishes the amount of ethylene and nitrous oxide which must be employed.

The operability in carcinoma of the stomach is particularly influenced by the location of the lesion, granted, of course, that there are not prohibiting metastases in the gastro-hepatic lymph glands and in the liver. As already stated, the most operable type of carcinoma is that arising in the prepiloric region without extension, allowing thus a large portion of normal stomach to be resected with a margin of safety beyond the lesion. The most unfavorable site for gastric carcinoma is that occurring along the lesser curvature, because malignant lesions here tend to contract and pull the esophageal opening into the stomach closer to the pylorus, so that there is a limited margin of normal stomach wall on the lesser curvature between the lesion itself and the point where the esophagus enters the stomach. Several times we have demonstrated a malignant lesion on the lesser curvature of the stomach which was operable so far as removability of the lesion, together with the absence of metastases, was concerned, but because of the fact that the lesion had so extended along the lesser curvature as to involve or almost involve the esophageal opening into the stomach, a sufficient gastric remnant could not be left so that a satisfactory anastomosis could be done. In such cases we have twice excised a portion of the esophagus as it enters the stomach, but this makes anastomosis between the jejunum and irregular gastric stump, a part of which is the esophagus, difficult and dangerous from the point of view of leakage.

The mobilization of the left lobe of the liver by incision of its ligamentous attachment to the diaphragm, an avascular structure, makes technical approach to the cardiac end of the stomach very much more easy and in cases with lesser curvature extension, it has twice proved possible for us to do successfully a complete and total gastrectomy with anastomosis of the jejunum to the esophageal opening into the stomach.

Dr H M Clute of this Clinic published such a successful case in 1930, a patient with extensive carcinoma of the entire stomach but without metastases. In this case he was able to remove the entire stomach and to anastomose the jejunum to the esophagus. This patient lived

*Woodbridge P D. Better Gas Anesthesia. The carbon dioxide absorption method. New Eng J Med. 208:632 (Mar 23) 1933.

ulcer may look and feel like a carcinoma even to the experienced eye and finger (Illustrations I and II) But if preoperative medical man-



ILLUSTRATION I This is the inside of a stomach removed by partial gastrectomy showing a large benign gastric ulcer. Compare with Illustration II carcinoma of the stomach.



ILLUSTRATION II This is the inside of a stomach removed by partial gastrectomy showing a lesion which to the eye appears almost identical to the lesion seen in Illustration I. A microscopic examination however proved to be carcinoma simplex. These two lesions are shown to demonstrate that exclusive of those cases of frank gastric cancer which can usually be diagnosed without exploration surgical exploration to demonstrate possible malignancy in borderline lesions is not of value.

agement of a doubtful lesion reveals a persistence of occult blood in the stools, a persistence of symptoms in spite of adequate treatment, and a persistence of the x-ray deformity, our experience shows that however innocuous the lesion may appear to the eye and finger, it is ma-

lignant, or an unhealable ulcer, and should be radically removed. And if by the same preoperative medical management there is a complete disappearance of occult blood and of symptoms and of x-ray defect, our experience has showed that the lesion is a healable ulcer. The location of the defect is of some value in differential diagnosis; the protruding niche of the lesser curvature media is rarely malignant, whether its size be large or small, whereas the rare greater curvature lesion located exactly on the greater curvature, is probably never benign. The nearer the lesion is to the pyloric sphincter, the greater is the likelihood of malignancy, though there are prepyloric lesions which are healable ulcers. The presence of achlorhydria is a distinct addition to the evidence for malignancy, but the presence of acid does not prove benignity.

In the frank cases of malignant lesions where there can be no doubt as to the nature of the lesion, the question often arises as to whether it is worth while to explore with the hope of removal of the lesion. In such cases, it is our opinion that radical surgery offers the best chance for extension of life, even in those cases where there is some evidence of metastases.

The third point which we have defined for discussion in this paper now arises, namely, the surgical measures which can be used to insure the longest possible freedom from recurrence.

In discussing the surgical treatment of cancer of the stomach, one must admit that not infrequently, because of factors already mentioned, surgery upon the stomach for malignancy must often be done when conditions are quite unsatisfactory. The ideal surgical situation in relation to cancer of the stomach is a small lesion of early malignancy located near the pylorus, permitting thus extensive and easy partial gastrectomy. Unfortunately, this early discovery is often not possible and surgery must frequently be applied to gastric malignancy under much less favorable conditions.

There are certain factors which have to do with the success of surgery in dealing with malignancy of the stomach, one of the most important of which is anesthesia. We have, in our experience with gastric resection, passed through several stages as relates to the type of anesthesia, beginning with ether, then with local anesthesia, next with spinal anesthesia, and now combined avertin, intratracheal ethylene and regional anesthesia. This latter combination of anesthetics has proved most satisfactory in our hands.

The disadvantage of ether anesthesia for gastric resections is that it tends to produce shock, particularly when patients have to be carried to considerable depth and kept under it for a comparatively long period of time as is necessary in gastric resections.

The difficulty of nitrous oxide and ethylene anesthesia is that they often do not produce ade-

the segment of jejunum which is to be anastomosed to the stomach to the posterior wall of the stomach before the lower portion of the stomach and its contained lesion is cut away. Thus, as has frequently been demonstrated and stated, prevents retraction of the gastric stump and makes suture of the jejunum to the end of the stomach much easier.

We have been particularly interested in a method of dealing with the proximal stump of the jejunum which has proved valuable in our

posterior root through which is passed a loop of jejunum to be anastomosed to the cut end of the stomach. This is the so called posterior Polya anastomosis.

The point which we wish to suggest in connection with this is shown in Illustration IV. After an opening has been made in the posterior leaf of the transverse mesocolon, the jejunum, where it emerges from its retroperitoneal portion, is put upon the stretch, the ligament of Treitz demonstrated, and the ligament cut by

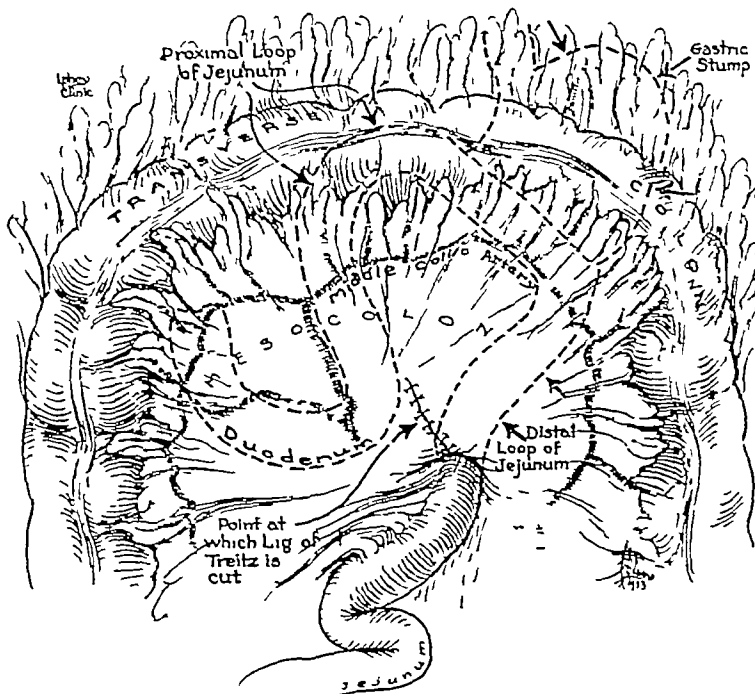


ILLUSTRATION IV This semi-diagrammatic illustration is shown to demonstrate the plan of transplanting the proximal loop of the jejunum above the mesocolon into what was the lesser peritoneal cavity. The gastric stump and the jejunum anastomosed to it is shown in outline with dashes through the turned up transverse colon and mesocolon. Note that the proximal loop of jejunum runs directly from the duodenum to the stomach and that as the result of incising the ligament of Treitz it has been transplanted entirely above the mesocolon. Note that the incision of the ligament of Treitz opens the mesocolon and that by this plan of transplanting the proximal loop of jejunum but a single loop of jejunum, the distal one emerges through the mesocolon permitting the mesocolon at the point where the ligament of Treitz was incised (indicated by arrows) to be closed accurately about it.

hands, was devised by one of us (F H L), and makes for better postoperative functional results than some of the previously employed procedures.

Following removal of the distal portion of the stomach and anastomosis of the jejunum to the remaining gastric stump, one of two procedures as relates to the proximal jejunum may be employed. A long loop of jejunum may be brought up over the transverse colon and anastomosed to the cut end of the stomach by the plan described and devised by Dr Donald Balfour, called the antecolic Polya anastomosis, or the transverse colon may be brought out upon the abdominal wall and an incision made in its

scissors up to its root. The incision of the ligament of Treitz then makes possible the transplantation of the proximal loop of jejunum entirely above the transverse mesocolon so that after the anastomosis is complete, the proximal section of the jejunum which is sutured to the lesser gastric curvature is entirely above the posterior leaf of the transverse mesocolon and but a single loop of bowel, the distal loop of the jejunum which runs from the greater curvature down into the peritoneal cavity, emerges through the rent in the transverse mesocolon. This makes possible the approximation of the rent in the transverse mesocolon about a single loop of bowel (Illustration IV), preventing thus the

in comfort and was able to support herself over a period of three and a half years

Total removal of the stomach with anastomosis of the jejunum to the esophagus has recently again been successfully accomplished by one of us (F H L) in a patient with the leather bottle type of carcinoma of the stomach without lymphatic or liver metastases (Illustration III)



ILLUSTRATION III An x ray picture following the ingestion of blismuth in a patient on whom a total gastrectomy was successfully done the jejunum being anastomosed to the esophagus This x ray was taken ten and a half weeks after operation

Note the passage of food at the arrow directly from the esophagus into the small intestine

The mortality of total gastrectomy will of necessity always be high, but based upon our experience now with four cases, two of which have been successful, it seems a justifiable risk to take if there are no evidences of metastases outside of the stomach itself, even though the lesion be an extensive one

Other than from the point of view of technical features, there is little to be said concerning the operation of gastric resection except as relates to the decision for or against it in cases with extensive carcinoma and with metastases. One must in these cases make up his mind as to whether a palliative gastro-enterostomy or a gastric resection should be done. As the result of our experience with this situation, we feel very strongly that if the patient is not too bad a risk, partial gastrectomy with the removal of the extensive lesion, even in the presence of liver metastases or gland metastases, is a much superior operation to gastro-enterostomy, and that it will provide the patient with greater comfort

and prolong his life to a greater extent than will palliative gastro-enterostomy. Palliative gastro-enterostomy, in our hands, has sometimes prolonged life, but frequently has not made the patient much more comfortable.

Another surgical problem which is frequently difficult to settle in very extensive carcinoma of the stomach is whether one is justified in doing jejunostomy in the hopeless cases. This is a problem which we have all at times found difficult to settle. Is it better to permit patients with carcinoma of the stomach, who are utterly incurable but who are unable to take fluids and food, to go on and die, or should they be made more comfortable and their life prolonged by the institution of jejunostomy? No acceptable position can be taken on this situation. It often is a decision which must be made by the family after they have been made familiar with all of the circumstances and sometimes by the patient himself.

A discussion of the technical features of partial gastrectomy should, in our opinion, be reserved largely for a surgical journal which is read by those who are interested primarily in surgery. There are, however, a few technical features, and one perhaps original suggestion based upon our operative experience with a considerable number of these operations that may be worth speaking of in connection with this operation.

Gastric resection for cancer usually must be of such extensiveness that any consideration of reanastomosis between the cut end of the stomach and the duodenum is not feasible. Therefore, following partial gastrectomy for cancer, the problem is practically always that of reestablishment of the alimentary stream by anastomosis of the jejunum to the stump of the stomach. This may be accomplished by one of two plans: either the Billroth Number Two operation, or by some modification of the operation which, in this country, is described under the name of the Polya operation. We have always preferred to employ the posterior Polya operation (III IV) because it saves time in that one row of sutures closing the cut end of the stomach is eliminated, and because it has always seemed to us that posterior Polya anastomoses functioned better than anterior anastomoses and were, in addition, more physiologic. When a large portion of the stomach is removed, as in resections for gastric cancer, leaving less than a third or a fourth of the stomach, it is often difficult, as in the Billroth operation, to do an anastomosis of the gastro-enterostomy type between the anterior or posterior wall of the stomach and the jejunum, since the remaining segment of stomach frequently retracts into the left hypochondrium where it is difficult to anastomose the jejunum to it. We have, therefore, made it a rule to employ the posterior Polya type of anastomosis, suturing

pathology Egdahl⁸, in an analysis of 108 cases, says that about 42 per cent of cases of acute pancreatitis are associated with gall stones, and considers them the most common single cause. In our series of 54 cases of acute pancreatitis, gall stones were present in 49 per cent. Speese⁹ maintains that retrojection of bile into the ducts of the pancreas is the most likely cause of acute pancreatitis, the presence of bacteria in the bile favors the development of the process. Some authorities, however, believe it more probable that even in the acute cases, the infection reaches the pancreas by way of the lymphatics. Judd, Mann, and Giordano¹⁰ studied the rôle played by the bile in producing pancreatitis and observed the anatomic relations of the common duct to the duct of Wirsung. In a survey of 200 consecutive autopsies they proved that in only 3.5 per cent of the cases it would be anatomically possible for obstruction at the ampulla of Vater to convert the two ducts into a continuous channel and permit bile to pass into the pancreatic duct. They also found that the muscle of Oddi can contract to convert the two ducts into one in very few cases, and that usually its contraction constricts both ducts.

Mann also investigated the degree of pressure necessary to force bile into the pancreatic duct. In most cases it required 500 millimeters. Bile was injected into the duct but did not produce pancreatitis until the pressure was much greater than that which could be produced by deep respiration or vomiting. Thus these investigations on animals over a long period of time led the authors to conclude that a reflux of bile into the pancreatic duct is rare and that this could not be considered a common cause of acute pancreatitis.

There was only one case in our series of a stone lodging in the ampulla of Vater. The patient was admitted with a history of recurring attacks of pain during an interval of 18 months. These attacks were accompanied by vomiting and slight jaundice. A diagnosis of chronic cholecystitis with cholelithiasis was made. Cholecystectomy with drainage was done and several stones removed from the cystic duct. Seven weeks later the patient returned with severe epigastric pain. She was dyspneic and cyanotic, and died a few hours after admission. No physical diagnosis was made. Postmortem examination revealed an acute hemorrhagic pancreatitis. A very small stone was found lodged in the ampulla of Vater (Fig 1).

There is also evidence that in some cases infection may reach the pancreas through the blood stream, but more frequently it is by way of the lymphatics. During embryonic life the lymphatics of the pancreas bear a close relationship to the lymphatics of the bile-ducts. That portion of the pancreas which is derived from the ventral anlage develops from one of

two buds which grow out from the primitive intestine very close to the liver bud or even from the lower part of the liver bud.

To understand the manner of pancreatic infection through the lymphatics, a careful review must be made of the lymph vessels of the pancreas, the various groups of nodes, the portion drained, and their close association with the

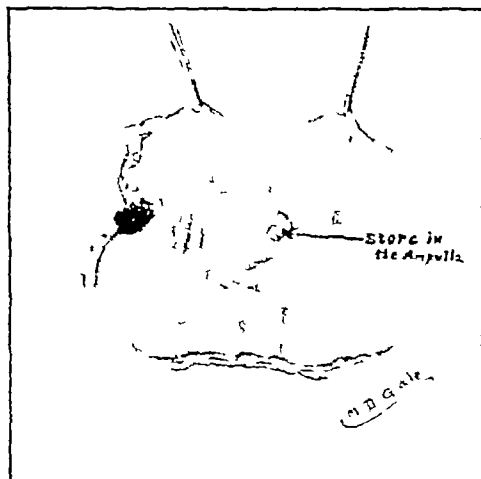


FIG 1 Inner wall of the duodenum showing a stone in the ampulla occluding the common duct.

lymphatics of the liver and gall bladder. These lymphatics, in turn, are part of the lymph channels accompanying the inferior and superior

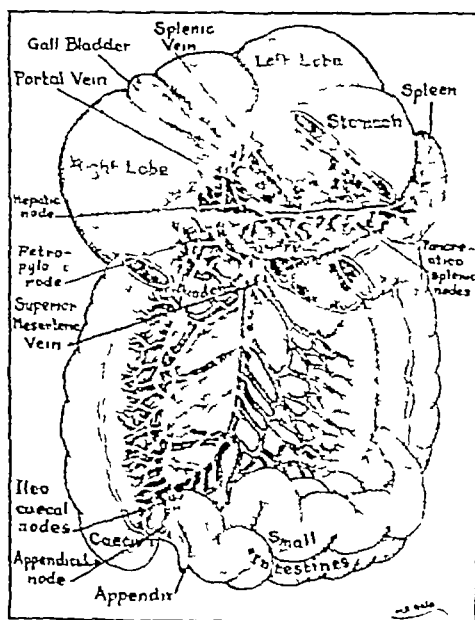


FIG 2 Lymphatic distribution from the appendix and the ascending colon to the pancreas.

mesenteric veins which drain the entire colon. Thus, bacillus-laden lymph from as remote a focus of infection as an appendiceal abscess might readily reach the pancreas (Fig 2).

In 1911 Franke¹¹ demonstrated the anas-

danger of hernia and making the course of the proximal loop of bowel an unangulated one. This plan of dealing with the proximal jejunal loop in gastric resections has now been utilized in over twenty cases and has proved a very satisfactory one.

There is little further to be said as to the surgery of gastric cancer except that in our opinion it must be aggressive in character. One must exercise the greatest diagnostic caution in making sure that the lesion is not a healable ulcer. Once having settled that the lesion in the stomach is malignant, it is then no time for faint-hearted surgery. The salvation of patients with cancer of the stomach, exclusive of early diagnosis, is in radical and extensive operations even up to total removal of the stomach.

CONCLUSIONS

The salvation of patients with carcinoma of the stomach is in early diagnosis.

Early diagnosis can be made only when x ray examinations of the stomach are made upon evidence which is only suspicious, and it must be accepted that many will prove negative.

The duration of the history is not a criterion of the extent of the disease.

Partial gastrectomy even in patients with metastases gives better results than palliative gastro-enterostomy.

Complete gastrectomy, even with a high mortality rate, is justifiable in selected cases.

Early diagnosis and radical partial gastrectomy offer definite hope for cure, as demonstrated by our cancer patients alive and well nine years, six years, five years, four years, three years, and two years after operation.

A method of dealing with the proximal loop of the jejunum in posterior Polya resections of the stomach is described and illustrated.

NEW HAMPSHIRE MEDICAL SOCIETY

ACUTE PANCREATITIS—WITH A REVIEW OF FIFTY-FOUR OPERATIVE CASES*

BY P E TRUESDALE, M D †

SPEAKING before the New York Pathological Society in 1889, Reginald H. Fitz¹ made a notable contribution to the study of acute pancreatitis. At that time the origin of the disease was attributed to the extension of a gastroduodenal inflammation along the pancreatic duct. The theory of chemical and autodigestive changes and the frequent accompaniment of cholelithiasis in cases of acute pancreatitis had been noted by investigators such as Opie², Flexner³, and others. In a case operated upon by Bloodgood⁴ a gall stone the size of a pea was found occluding the ampulla of Vater, thus forming a continuous passage through which the bile traveled from the common duct directly into the pancreatic duct. The inference was made that in many cases a stone might become temporarily lodged long enough to allow damage to the pancreas and then escape, leaving no other evidence of its presence. Fitz by a comprehensive study of the terminal changes in the pancreas, outlined a more definite symptomatology and a more precise pathology than had hitherto been known.

Considerable progress in the clinical recognition of acute pancreatitis has been made since this time, but, owing to the relatively infrequent incidence of the disease, opinion has not crystallized on a definite theory as to etiology.

The mortality rate remains high. McWhorter⁵ considers diagnosis still difficult and regrets the high mortality statistics in this "highly fatal condition." Stetten⁶ calls the acute fulminating hemorrhagic type an almost hopeless catastrophe. In a collection of 1,510 cases from German clinics 149, or 10 per cent of the patients died before operative intervention and 68 per cent died following operation. In Stetten's series the mortality was 71 per cent.

Two theories as to etiology are frequently propounded. An influx of bile or duodenal contents through the duct may start the process, or an infection may occur from lymphatic invasion from without, usually from the biliary system. Moschcowitz⁷ said that he was not sure that the much lauded operation of cholecystectomy saved more than a small percentage of cases. He did two exploratory laparotomies for acute pancreatitis and merely removed the appendix. Both patients made an uninterrupted recovery, which indicates that perhaps the disease often subsides spontaneously. A third patient was operated upon for acute cholecystitis. No gall stones were found, but there was an acute hemorrhagic pancreatitis. Cholecystectomy was done. The night before the patient was to be discharged from the hospital another attack of acute pancreatitis occurred and the patient died.

The close anatomical relationship of the pancreatic duct and the common bile duct is an important factor, however, in the associated

*Read at a meeting of the New Hampshire Medical Society on Tuesday May 16 1933.

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died, a mortality of 20.5 per cent. The primary cause of death was respectively diabetic coma, acute nephritis, valvular heart disease, cirrhosis of the liver, ruptured gallbladder (two cases), acute cholecystitis, and thrombophlebitis of the splenic vein. In two cases the pancreas had sloughed and there was free blood in the peritoneal cavity. In nine of the cases there was considerable fatty metamorphosis of the liver and many areas of fat necrosis on the pancreas, omentum, mesocolon, pylorus, and intestines.

Seven of the eleven fatal cases were of the fulminating hemorrhagic type. In eight of these the condition was discovered at autopsy.

The diagnosis of acute pancreatitis was made after exploratory laparotomy in 28 of the cases. In 18 a correct diagnosis was made prior to operation. A palpable mass in the epigastrium enlarged and tender sometimes aided in the differentiation. Since most of the cases were associated with acute cholecystitis, it was difficult to interpret symptoms correctly, especially since they might be referable to gallbladder disease.

In 47 or 89 per cent of the 54 cases cholecystitis was present. Gall stones were found in 26 cases. In one a gall stone had lodged in the ampulla of Vater. Seven cases were complicated by appendicitis. In two, large calcified lymph glands were seen in the region of the head of the pancreas. In six there was marked sloughing of the pancreas. Two of these cases were fatal.

One case was traumatic, the attack occurring after a fall from a ladder, at least the onset of the disease was thus accounted for in the records, but it is possible that the acute attack may have caused the fall from the ladder. There were multiple contusions of the abdomen and hemorrhage into the pancreas. The following day a hard mass was felt in the head of the pancreas. After drainage of the pancreas the man recovered.

In 17 cases the pancreas was incised or penetrated with the finger and drained. In one case the tail was involved, in three the head and tail, and in seven the entire organ.

In eight instances, portions of the pancreatic tissue were excised for microscopic examination. Biopsy of the pancreas may result in hemorrhage sometimes very difficult to control.

Operative treatment as follows

Cholecystectomy and drainage	6 cases
Drainage of biliary passages	21 cases
Drainage of pancreas only	4 cases
Combined drainage of pancreas and bile ducts	13 cases
Total	44 cases
Discovered at autopsy	10 cases

In the majority of the cases the acute disturbance in the pancreas cleared up when the bile passages were drained. Surgical interference was prompt and at operation the presence

of areas of fat necrosis on the peritoneum confirmed the preoperative diagnosis. In the hemorrhagic cases there was bloody fluid in the abdomen and necrosis of pancreatic tissue.

The phenomenon of hemorrhage in the fulminating cases is still unsolved, but is thought to be due to the activation of the pancreatic secretion trypsinogen. When infection causes cellular death, the trypsinogen is transformed into trypsin which brings about autolysis of the pancreas. All the conditions which may cause this activation of pancreatic juice are not known.

In the acute cases without hemorrhage, the presence of fat necrosis is considered the pathognomonic sign. Langerhans first demonstrated fat necrosis by the action of fresh pancreatic juice upon living fat tissue. This lesion results from the escape of pancreatic ferments into fat tissue, splitting the fats into fatty acid and glycerine. The presence of fat necrosis was formerly interpreted as a fatal sign, but we know today that, although the changes in the gland are rapid and destructive, prompt surgical interference assures recovery in the majority of cases.

We are indebted to the late Dr C. A. Porter¹⁶ of Boston for suggesting a radical measure in dealing surgically with acute hemorrhagic pancreatitis. It consisted in making an incision over the entire length of the pancreas. He described this method in an article which appeared in the *Boston Medical and Surgical Journal* in 1903 shortly before I had operated upon my first case. I adopted the method and believed that in so doing I saved the patient.

SUMMARY

Acute pancreatitis is an acute infection in a deep seated vital organ often fulminating occasionally destructive. No other abdominal ailment has initial symptoms more characteristic. It is manifested by the acute severity of onset agonizing epigastric pain accompanied by vomiting. The acute fulminating cases demand immediate intervention. Cases of moderate severity may yield to drainage of the bile passages. When the hemorrhage is diffuse and involves the entire organ, the pancreas should be opened longitudinally and drained liberally, care being taken not to incur the liability of massive hemorrhage. The recognition of fat necrosis is often the key to the diagnosis.

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tomoses of the lymphatics of the gall bladder with those of the head of the pancreas. He showed that areas of inflammation in the pancreas correspond with the lymphatic distribution. A node at the neck of the gall bladder ordinarily called the sentinel gland, communicates with the lymph vessels of the pancreas. This node is frequently enlarged in cases of chronic pancreatitis. There is also close connection between the afferent and efferent branches of the lymphatics of the pancreas and the duodenum. A blocking of the nodes in any part of the lymphatic system makes possible a reversal of the flow of lymph into efferent pancreatic vessels and in this way infection is readily carried to the pancreas.

The lymphatic vessels of the pancreas arise from a network about the pancreatic lobules. These trunks anastomose freely on the surface of the pancreas. Some terminate in the splenic glands which send vessels to the celiac glands. Others pass directly to the celiac glands. The lymphatics at the head of the pancreas communicate with the duodenal lymphatics and the lymphatic vessels of the lower end of the common duct.

Deaver¹² concluded that in many cases of acute pancreatitis the infection was borne by the lymphatics because the disease is not often associated with the lodgment of a gall stone in the ampulla of Vater. Besides, in a fair percentage of cases gall stones are not present. In cases with complications the focus of infection might be exceedingly difficult to determine. The views presented show the wide lack of agreement among authorities.

SYMPTOMS

The symptoms of acute pancreatitis are striking and quite typical of the infection. The organ, however, is deeply situated in the body and does not give surface manifestations until markedly affected. There are so many other lesions in the upper abdomen which cause severe pain that the pancreas may not be considered in making the diagnosis.

The onset is usually sudden. Severe agonizing pain is referred to the epigastrium, radiating to the sides and back. Moynihan¹³ describes the pain as the most severe type encountered from any lesion within the abdomen. He believes that no other catastrophe within the peritoneal cavity can produce so profound a collapse.

Pressure of the engorged pancreas on the duodenum causes vomiting. There may be slight jaundice and clay-colored stools. In the more fulminating cases there is severe prostration sometimes followed quickly by death. To describe this condition the term "pancreatic apoplexy" is used.

It is well to keep in mind the fact that acute

pancreatitis is a disease of marked variation in the degree of its severity from a mild inflammatory process which subsides spontaneously to the fulminating hemorrhagic type which causes death soon after the onset of the attack. This severe type is a well-recognized cause of sudden death, but such cases are seldom recognized except at autopsy. For example, Graham¹⁴ has recorded a case with a history of repeated attacks of pain over an interval of six months. A diagnosis of appendicitis was made and the appendix removed. The attacks of pain recurred. At a second operation an acute hemorrhagic pancreatitis was found. The patient made a complete recovery and was entirely relieved.

Butler and Delprat¹⁵ think that small hemorrhages occur frequently in the pancreas and cause gastric upsets which have been attributed to indiscretions in diet. If the hemorrhage occurs in the head of the pancreas and if pathological changes exist in the bile passages, a pancreatitis often results. On the other hand, if the hemorrhage is slight and arises in the body or tail of the pancreas, recovery is to be expected without marked alteration or destruction of the gland.

As an example of the more severe hemorrhagic type, U W, suffering from severe abdominal pain accompanied by vomiting, entered our hospital September 4, 1925 several days after the onset of the attack. Two years previously his appendix was removed after it had perforated. On that occasion examination of the gallbladder revealed the presence of gall stones. Before leaving the hospital the patient was informed of the condition of cholelithiasis and advised to return for operation if symptoms warranted. In spite of this admonition, when the attacks of abdominal pain occurred the patient delayed five days before reentering the hospital. Cholecystectomy was done and several strips of rubber dam were used for drains. The pancreas was felt to be enlarged but there was no evidence of fat necrosis. The patient grew rapidly worse and died five days after operation. Autopsy revealed an acute hemorrhagic pancreatitis with areas of fat necrosis showing only on the under side of the mesocolon.

The lesson to be derived from this experience leads one to realize that the discovery of an acutely inflamed gallbladder filled with stones may not be the main pathological process causing an acute attack, the result of which may prove fatal. It is incumbent upon the surgeon to exclude acute pancreatitis both by manual and visual examination of this organ and by a careful search for fat necrosis.

REVIEW OF CASES

There were 54 operative cases of acute pancreatitis in our clinic, 42 in females, 12 in males. Twelve of the 54 cases were of the acute hemorrhagic type. Eleven out of the 54 patients

or if there is a fat necrosis. Then, too, marked distention of the transverse colon, without obstruction, is a valuable sign. The stomach may be displaced in various directions by the swollen gland. The pancreas should be approached at the point of bulging.

There is no object in incising the pancreas unless it appears distended or unless there is a hematoma present. There is less danger of absorption from the serous surface of the peritoneum than from the retroperitoneal cellular tissues. The pancreas should be opened only after carefully protecting the general peritoneal cavity by a coffer dam of gauze and a local collection of fluid may be evacuated by an aspirator. Also, the hematoma or abscessed cavity should be incised only after its contents have been withdrawn. The biliary tract should not be interfered with, except for very positive indications and only when the patient is in reasonably good condition.

DR. W. J. PAUL DYE, Wolfeboro. I would like to know a bit more about the actual surgical technique used in the approach to the pancreas, the character and indications for placing drains and the type of drains used in such procedure.

DR. RICHARD W. ROBINSON, Laconia. I would like to ask Dr. Truesdale if there is still considered to be any relationship between mumps and acute pancreatitis and also while it has been said that the condition is readily diagnosed if it is thought about just what the distinguishing signs are between an acute abdomen due to hemorrhagic pancreatitis and such a condition as perforating gastric ulcer with out previous gastric symptoms.

DR. PHILEMON E. TRUESDALE. I was glad to hear Dr. Taylor speak about the inflammatory process outside the peritoneum. By that, I assume, he meant the infection. That is peritonitis not actually an inflammatory process in the serosa itself but an infection that travels through the lymphatics under the peritoneum. The relationship between mumps and acute pancreatitis I do not know. We do know that parotitis is a not infrequent complication of other remote infections.

Dr. Dye spoke about the technique of the operation. Ordinarily when you are not sure of the diagnosis you would open the abdomen by a vertical paramedial incision. It is the most satisfactory approach. However if one knew definitely that he was doing an operation for acute hemorrhagic pancreatitis he should make a transverse incision. That would make the entire length of the pancreas accessible. For drains we use rubber dam. We feel that it is advisable to make a long opening in the pancreas. If nothing more is done than a decompression and drainage this may control the disease. The incision through the anterior surface of the pancreas should extend throughout the length of this organ. This operation was originally advocated by Dr. C. A. Porter as I have mentioned in the text.

In the other group of cases where radical measures are not necessary and where the disease can be treated by an operation that deals with some other structure than the pancreas such as the gall bladder or the common duct, I think one of the other speakers mentioned cholecystectomy as removing the focus of infection. It does and so far as that goes it is very helpful. But you have to do something more than remove the focus of infection if such it is because the inflammatory process in the head of the pancreas leaves all the tissue engorged

and under tension. Usually there is some interference with the flow of bile out to the duodenum. If that bile is sidetracked you have gained so much more in relieving the stress that is being placed upon the pancreas. So cholecystectomy, if done should be supplemented by drainage of the common duct.

I would say that in the acute hemorrhagic type a radical opening in the pancreas would be an effective procedure providing the surgeon is careful not to produce alarming hemorrhage.

In the other class drainage of the gall bladder or the removal of the gall bladder and drainage of the common duct would be the procedure. In order to dislodge small stones impacted at the ampulla Dr. F. H. Laher uses suction while Dr. David Cheever advocated putting a catheter into the common duct and washing it out. Either method will clear the common duct and establish effective drainage into the duodenum after the pancreatitis subsides.

Dr. Robinson asked for a discussion of the differential diagnosis. The history I should say is the most important element in the differential diagnosis. The onset of acute hemorrhagic pancreatitis is usually sudden, the pain excruciating and accompanied by nausea and vomiting. The laboratory tests, the x-ray, the white count, the blood sugar all help but the history and the physical examination are all important. We find that many of the patients with acute pancreatitis have normal urine and practically a normal blood sugar. Dr. Robinson spoke about differentiating acute pancreatitis and perforated gastric ulcer. If the patient has a history of ulcer before the attack that would make one suspect perforation of an ulcer. In perforated ulcer, however, there is one sign that is unmistakable and you can bank on it in over ninety per cent of the cases. That is the board like rigidity of the whole abdominal wall. If that sign is discovered on palpation you may say with a fair degree of certainty that the patient has a perforated peptic ulcer. On the other hand in pancreatitis the rigidity of the muscles will be limited to the upper abdomen.

About two months ago there was a patient coming east from North Adams. Soon after leaving the station, she was seized with agonizing abdominal pain accompanied by vomiting. The train stopped at Gardner. Dr. A. F. Lowell had the patient transferred to the Heywood Memorial Hospital. After examination there he believed her severe symptoms were caused by a ruptured ulcer of the stomach and advised immediate operation. Dr. Lowell conferred with me by telephone. In reciting the history he stated that the patient had never suffered from symptoms suggesting the previous existence of peptic ulcer. He noted also that muscular rigidity was almost entirely confined to the upper abdomen and that there was a somewhat indefinite tender mass in the epigastrium. Knowing that Dr. Lowell was a careful and competent surgeon I concurred with him in the belief that the patient should be operated upon without delay, adding that in a case of this type one should have acute pancreatitis in mind and a careful search should be made for the pinhead areas of fat necrosis which is the pathognomonic sign of the disease. He called me back about two or three hours later and said 'I found the little white spots and merely drained the gall bladder.' The patient recovered. This happy result was due to the fact that the operation was done within a few hours of the onset of the attack when a simple procedure was safer and more effective than a radical operation if done 24 hours later.

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DISCUSSION

DR. HERBERT L. TAYLOR, Portsmouth The possibility of acute pancreatitis, if borne in mind when ever an acute abdominal mishap presents itself, offers no greater difficulty in diagnosis than does any other acute surgical condition. Acute pancreatitis is not a primary disease but rather a sequela. One must face the fact that biliary disease is usually the precursor. Previous gastro-intestinal disorders are of great significance. The symptoms are due to local pancreatic irritation, as well as those due to the circulation of toxic products. Inflammation of the pancreas results in edema and swelling of that organ. Stretching of the pancreatic capsule induces pain. Diaphragmatic excursion may be obstructed and biliary drainage impeded. Pressure on the semilunar ganglion should be taken into consideration in explaining the symptomatology. Circulation of foreign protein and its products of incomplete digestion may, in part, explain the severe toxemia present. Digestion of blood vessels contributes the hemorrhagic features of the picture in this disease.

Inflammation of the peritoneum is due to the irritants circulating under the serosa. Constant epigastric pain is most frequently encountered. It is splitting in character as though something within were trying to force its way out. Some patients have general abdominal pain, and others have right or left hypochondriac pain or back ache.

The pain in acute pancreatitis is of intense severity, and morphine frequently repeated often fails to relieve it.

Vomiting is also a very troublesome and persistent symptom. Emesis is never fecal in character. Gastric lavage relieves it. The foreign protein present in the circulation calls forth a peculiar train of symptoms such as shock, collapse, cyanosis, dyspnea and skin reactions. Elevation of temperature does not help because it usually varies a great deal. The pulse rises out of all proportion to the temperature ratio. Icterus due to pressure on the bile duct is never severe. Epigastric tenderness is frequently present. Constipation and not diarrhea is the rule. The silent belly offers a contrast to the active one of mechanical obstruction.

In animals, in the absence of an obstruction at the ampulla of Vater, we have been unable to produce regurgitation into the duct. In man a reflux of bile into the pancreatic duct through the agency of a stone impacted in the ampulla has frequently given rise to acute pancreatitis, but the mechanism accounts for only a minority of instances. Anatomic possibilities are retained and possibly such reflux of bile may be conditional through disturbance in the sphincter, regulating the mechanism of the ampulla. The actual occurrence of pancreatic

necrosis through such an agency in man remains to be demonstrated.

Following acute infections in the biliary tract, cloudy swelling of the pancreas is regularly observed and actual necrosis does not result.

Clinically, pancreatic injury of a similar character appears to be an occasional accompaniment of acute infection of the gallbladder. Proof that these pancreatic changes are precursors of and eventuate in an actual necrosis is lacking, but that in the presence of an activating influence for trypsinogen such changes may eventuate in actual necrosis, it appears to be substantiated. The effective activation of trypsinogen would appear to be the essential factor. Although pancreatic tissue and the products of its disintegration may activate trypsinogen in vitro, animal experimentation demonstrates that injury to the gland is affected through ligation of the duct. Infection or mechanical trauma is usually inadequate as a single factor to produce acute necrosis.

The results indicate the direction of subsequent investigation, namely, that the solution of the cause of, probably, many instances of acute necrosis is to be found in a combination of factors which alone are inadequate.

Now, as a matter of fact, few operations have been done within a few hours of the onset of the disease. Usually the patient does not come under surgical care until the second or third day of the disease, and, in many of these cases, as in other cases of diffuse peritonitis, it is safer sometimes to encourage localization of the process before instituting drainage. Certainly, one should not wait until the patient is moribund from sepsis. Sometimes it is possible to wait until well localized time-faction indicates the presence of an abscess or of gangrene, but, whenever a case is seen before symptoms of profuse peritonitis arise the surgeon should lose no time in opening the abdomen to evacuate the toxic extravasation.

As to the matter of treatment the important point is to save life. One must relieve the pressure of the semilunar ganglion and common duct by opening the pancreatic capsule. If the patient's condition is good the operation of choice is cholecystectomy in order to remove the source of infection. At other times, the drainage of the gallbladder is all the patient will stand, and therefore it must suffice to drain the pancreas. Proper and early treatment of biliary disease will decrease the mortality rate of acute pancreatitis. The time to operate is when the disease is still confined to the gallbladder.

The pancreas is surrounded in man by abdominal vessels of importance. The pancreatic fluid in the peritoneal cavity causes fat necrosis and fatal peritonitis. One may expose the pancreas through the gastric hepatic ligament or through the gastrocolic ligament. One can obtain the best view of the organ through the latter method.

Operations for pancreatitis vary according to the stage of the disease. In acute conditions where the pancreas is greatly swollen short incisions are made into the pancreas to relieve tension and are enlarged by inserting closed forceps and spreading the jaws. Drainage with tubes and gauze is carried down to the wound in the pancreas. If there is free oozing, the supply of gauze drainage should be abundant. The approach to the pancreas is usually made through the gastrocolic omentum. The necessity for incision into the pancreas must be decided by the character of the inflammation. The subacute and chronic cases require only drainage of gallbladder or common duct.

Pancreatic disease is to be suspected if as soon as the abdomen is opened there is a bloody exudate

pass the art of medicine as expressed in its practice

Today we face an ever-increasing army of modernly educated physicians, most of them seeking to discover through research in laboratories and clinics the cause of disease. This vast army is ready to apply acquired knowledge to prevent the recurrence of disease which engages its time and brings a livelihood. We recognize already a lessening demand for our profession. Preventive measures as applied by physicians have eliminated many diseases which once occupied the profession's attention. Sanitary laws and immunization, the result of professional knowledge and agitation, are rapidly making life safer in all localities, a contribution so great that the people now think of the state of the benefactor instead of the medical achievement. Medicine is not the result of chance, it is the product of many minds deeply interested in human beings.

It would be inconceivable for the medical profession to fulfill its high task in the service of humanity if it were not working as an organization, having fixed principles to guide it. The people should know this, and if they were properly advised they would sustain any effort on the part of medical men to build a strong, responsible Association, for it conserves the health of the people.

Nothing should be permitted to destroy harmony of action within the profession. The well-being of humanity is intimately associated with the high ethical concept adopted and preserved by the medical profession to sustain its own nobility and its interest in the people's welfare.

Eliminate the application of accurate medical knowledge through ill-considered economic practices to the conceivable point of diminishing monetary return, and medicine will, in a large measure, become an abstract science, valued as an intellectual pursuit, but deprived of an important human incentive, which incentive has so definitely made the science and art of medicine serviceable to humanity.

Today society is so complicated that if medical knowledge lagged or ceased to progress, it is conceivable that society, as we know it, would wane and the human race be left to struggle with the recurring pestilences of the past. Education and ethics, the great motives underlying medical organization, furnished the cementing force which unites men to a common purpose. This purpose has always contemplated the welfare of the human race.

In 1902, the American Medical Association was organized as a modern expression of the sentiment which has held medical men together as a body throughout the ages. Medical men believe in the elevating quality innately existing within the profession. Seemingly it is true that the educated physician in any age has been a superior man. Though exact scientific knowl-

edge may have been lacking, there has always been something ennobling in the study and the traditions of medicine, which caused men to catch the real vision of life's values. There was simple living and high thinking. There has been orderly evolution in the construction of the roadway of scientific fact.

An organization such as the American Medical Association must necessarily have a code of ethics, and although our code is the outgrowth of tradition, it is a modern expression of our desire to relate our interests to those of the people, and to serve the people in a uniform manner. It does not abridge the rights of any man, and as a living manifestation of ethical restraint it can be viewed triumphantly, for the golden thread of moral and spiritual values can be traced through all medical history.

Conservatism is a normal view of the average practitioner. Any change in method of practice is resisted until it becomes clearly apparent to the majority in a locality that change is necessary. Social trends may be recognized and yet the medical man will be slow to adopt new methods. Such conservatism is normal and, in the broadest sense, is probably for the good of society.

If it be true that society is best served by a great profession not easily swerved from its ideals and mode, then society should be willing to have any proffered plan to revise medical practice thoroughly discussed and made genuinely sound before a radical change is adopted. The time necessary for a solution should be conceded by society.

Organized medicine believes that it has several definite functions. First, and most important, it must practice medicine, and when this is said, actual contact with individuals who are sick is meant.

Influenced by economic urge and mechanism which tends to destroy the intimate relationship between the doctor and patient, will find its reflex in disturbed professional service, destructive to human satisfaction.

We believe that as an organization it is our duty to protect individualism in the practice of medicine, and it is wholly logical for us to resist socialization of medicine from any source.

We readily perceive, however, that there are superficially informed persons who would have medical men less individualistic. They would place them in groups under a leadership, lay and professional, which would tend to destroy the right of self-determination in the practice of medicine. We believe such a condition would lessen initiative and develop a tendency to mechanize medicine. If so, the contact of patient and doctor would become less intimate and the true story which every patient wishes to tell, would remain, in many instances, unrevealed. In harmony with Schweitzalla, I may say

THE PUBLIC AND OUR PROFESSION*

BY EDWARD H. CARY, M.D.†

TODAY, I come as the president of the American Medical Association to speak to you of what this organization has meant to us in a social, material and spiritual sense. I shall also call attention to the importance of this great medical association to the people whose health and happiness is the result of constant vigilance on the part of the members of our great organization.

The progress of the science of medicine has been accomplished in a most orderly manner. It has been directed and purposely guided in research and distribution of knowledge, and through its activities there has been an esprit de corps developed in the rank and file of medical men throughout the United States. Knowledge possessed by a member is quickly publicized after it has been presented to confrères in open forum. Our association develops new ideas, new truths, or maybe old truths further illumined. It stimulates and captivates the minds of our fellow workers.

A great community interest encourages the individual doctor and sharpens the competition for him, because the people are free to choose those who can retain and best use the information acquired. This is made possible for all the people because of the activity and orderly force created and kept alive by organized medicine.

If we are to interpret properly the attitude of the medical profession by its behavior during this period of general distress, it is helpful to review some of the strata underlying the medical structure. With this in view, I shall attempt to present some of the related causes of medical opinion.

It is interesting that, of all of the associations of men that for centuries have bound themselves together for a common purpose, the profession of medicine is the only one which has grown stronger and more dignified through the years. It has survived as an entity because of the basically sound policy of the free distribution of knowledge, imparted by its members each to the other, for the purpose of serving the human race. The improved technique has become the property of all who cultivate the art and science of medicine, thereby society is benefited.

Medicine readily becomes an instrument of the brotherhood of men who are engaged in properly interpreting Nature's secrets. Medicine, both a science and an art, is gloriously stimulating for it lays bare the gamut of human emotions. The science of medicine bridges human eccentricities, and all ethnological circumstances.

Disease affects individuals differently, depending upon the immunity acquired. Cellular reactions in human beings, when observed and recorded, represent widespread experiences.

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The thirst for knowledge became the ruling factor in medical education and this incentive is the binding force which underlies the progress of the medical profession.

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Suppose we now turn our attention to the influence of modern conditions upon material and ethical problems in medicine as we find them today. We cannot ignore the higher cost in time and money necessary to create competent physicians. The modern medical man is confronted with an ever-growing science which often develops more rapidly than he can encom-

*Read at a meeting of the New Hampshire Medical Society on Tuesday, May 17, 1933.

†Cary—President American Medical Association June 1932 to June 1933. For record and address of author see "This Week," page 103.

pass the art of medicine as expressed in its practice

Today we face an ever-increasing army of modernlv educated physicians most of them seeking to discover through research in laboratories and clinics the cause of disease. This vast army is ready to apply acquired knowledge to prevent the recurrence of disease which engages its time and brings a livelihood. We recognize already a lessening demand for our profession. Preventive measures as applied by physicians have eliminated many diseases which once occupied the profession's attention. Sanitary laws and immunization, the result of professional knowledge and agitation, are rapidly making life safer in all localities, a contribution so great that the people now think of the state of the benefactor instead of the medical achievement. Medicine is not the result of chance, it is the product of many minds deeply interested in human beings.

It would be inconceivable for the medical profession to fulfill its high task in the service of humanity if it were not working as an organization, having fixed principles to guide it. The people should know this, and if they were properly advised they would sustain any effort on the part of medical men to build a strong, responsible Association, for it conserves the health of the people.

Nothing should be permitted to destroy harmony of action within the profession. The well-being of humanity is intimately associated with the high ethical concept adopted and preserved by the medical profession to sustain its own nobility and its interest in the people's welfare.

Eliminate the application of accurate medical knowledge through ill-considered economic practices to the conceivable point of diminishing monetary return, and medicine will, in a large measure, become an abstract science valued as an intellectual pursuit, but deprived of an important human incentive, which incentive has so definitely made the science and art of medicine serviceable to humanity.

Today society is so complicated that if medical knowledge lagged or ceased to progress, it is conceivable that society, as we know it, would wane and the human race be left to struggle with the recurring pestilences of the past. Education and ethics the great motives underlying medical organization furnished the cementing force which unites men to a common purpose. This purpose has always contemplated the welfare of the human race.

In 1902, the American Medical Association was organized as a modern expression of the sentiment which has held medical men together as a body throughout the ages. Medical men believe in the elevating quality innately existing within the profession. Seemingly it is true that the educated physician in any age has been a superior man. Though exact scientific knowl-

edge may have been lacking, there has always been something ennobling in the study and the traditions of medicine, which caused men to catch the real vision of life's values. There was simple living and high thinking. There has been orderly evolution in the construction of the roadway of scientific fact.

An organization such as the American Medical Association must necessarily have a code of ethics, and although our code is the outgrowth of tradition, it is a modern expression of our desire to relate our interests to those of the people, and to serve the people in a uniform manner. It does not abridge the rights of any man, and as a living manifestation of ethical restraint it can be viewed triumphantly, for the golden thread of moral and spiritual values can be traced through all medical history.

Conservatism is a normal view of the average practitioner. Any change in method of practice is resisted until it becomes clearly apparent to the majority in a locality that change is necessary. Social trends may be recognized and yet the medical man will be slow to adopt new methods. Such conservatism is normal and, in the broadest sense, is probably for the good of society.

If it be true that society is best served by a great profession not easily swerved from its ideals and mode, then society should be willing to have any proffered plan to revise medical practice thoroughly discussed and made genuinely sound before a radical change is adopted. The time necessary for a solution should be conceded by society.

Organized medicine believes that it has several definite functions. First, and most important, it must practice medicine, and when this is said, actual contact with individuals who are sick is meant.

Influenced by economic urge, any mechanism which tends to destroy the intimate relationship between the doctor and patient, will find its reflex in disturbed professional service, destructive to human satisfaction.

We believe that as an organization it is our duty to protect individualism in the practice of medicine, and it is wholly logical for us to resist socialization of medicine from any source.

We readily perceive, however, that there are superficially informed persons who would have medical men less individualistic. They would place them in groups under a leadership lay and professional, which would tend to destroy the right of self-determination in the practice of medicine. We believe such a condition would lessen initiative and develop a tendency to mechanize medicine. If so, the contact of patient and doctor would become less intimate and the true story which every patient wishes to tell, would remain, in many instances, unrevealed. In harmony with Schwitalla, I may say

THE PUBLIC AND OUR PROFESSION*

BY EDWARD H. CARY, M.D.†

TODAY, I come as the president of the American Medical Association to speak to you of what this organization has meant to us in a social, material and spiritual sense. I shall also call attention to the importance of this great medical association to the people whose health and happiness is the result of constant vigilance on the part of the members of our great organization.

The progress of the science of medicine has been accomplished in a most orderly manner. It has been directed and purposely guided in research and distribution of knowledge, and through its activities there has been an esprit de corps developed in the rank and file of medical men throughout the United States. Knowledge possessed by a member is quickly publicized after it has been presented to confrères in open forum. Our association develops new ideas, new truths, or maybe old truths further illumined. It stimulates and captivates the minds of our fellow workers.

A great community interest encourages the individual doctor and sharpens the competition for him because the people are free to choose those who can retain and best use the information acquired. This is made possible for all the people because of the activity and orderly force created and kept alive by organized medicine.

If we are to interpret properly the attitude of the medical profession by its behavior during this period of general distress, it is helpful to review some of the strata underlying the medical structure. With this in view, I shall attempt to present some of the related causes of medical opinion.

It is interesting that, of all of the associations of men that for centuries have bound themselves together for a common purpose, the profession of medicine is the only one which has grown stronger and more dignified through the years. It has survived as an entity because of the basically sound policy of the free distribution of knowledge, imparted by its members each to the other, for the purpose of serving the human race. The improved technique has become the property of all who cultivate the art and science of medicine, thereby society is benefited.

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The thirst for knowledge became the ruling factor in medical education and this incentive is the binding force which underlies the progress of the medical profession.

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Suppose we now turn our attention to the influence of modern conditions upon material and ethical problems in medicine as we find them today. We cannot ignore the higher cost in time and money necessary to create competent physicians. The modern medical man is confronted with an ever-growing science which often develops more rapidly than he can encom-

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cians to cities, and the ever-increasing number of specialists. The public has been educated to the value of the applied sciences. Medical practitioners find their clientele frequently looking to the public health authorities for preventive measures and services which the practitioner should perform. It has been said that this is largely the result of a lack of interest on the part of the profession.

The Commissioner of Public Health in Detroit, Michigan, is intelligently using the medical profession in his work. He has awakened the profession to the importance of the prevention of disease, which has been of decided advantage to the general public in Detroit, as well as to the physicians involved. He has made of each doctor's office a community health center. Public health officials should likewise co-operate with the leaders of the medical profession in various localities.

Not only forty per cent, but eighty or ninety per cent of the children in a community should be immunized against those diseases for which we have preventive measures. This can never be accomplished by the public health authorities without great detriment to the medical profession, unless the two forces cooperate.

It is generally recognized that good health is one of the important necessities of life. With physical vigor, a people may be happy, and through contentment one might visualize prosperity. Dependence and unemployment often follow in the wake of sickness. Since health in a measure can be purchased, we must realize that a country which habitually attempts to regulate its industries, and has developed universal education at the expense of the people is likely to make an effort to conserve and improve their health, through similar regulatory measures.

It remains to be seen whether the medical profession will broadly provide the leadership to guide and direct this social trend. The economic situation at this time has stimulated a widespread interest in evolving a plan to meet the present condition. Though it is obvious that methods must be devised and previous ideas of medical care adjusted, we must not lose sight of the fact that social needs today are more extreme than we anticipate for the future. However, we recognize that it is our duty to mobilize the best current scientific knowledge for the benefit of the individual in the community.

The public is unaware of the extraordinary amount of labor and time, with monetary outlay, required to equip men and women for medical service. I dare say the public knows little of the risks and uncertainties of medical practice, and the expense of maintaining proper facilities for carrying on. Do they ever think that their doctor may lose his health and be deprived of his income?

The average physician is frequently con-

fronted with an economic problem which makes the practice of medicine precarious. It is clearly the duty of organized medicine to check the growth of community programs for medical service which undermine the financial stability of the individual physician. We concede the ideal that every family should have 100 per cent of needed medical service. We recognize that families with annual incomes under twelve hundred dollars receive but approximately 33.3 per cent of needed health care, and while those of greater amount receive correspondingly more medical service, it will require the coöperation of an enlightened citizenship with a willing profession to develop plans suitable to the needs of a given locality. Many county medical societies are experimenting with various ideas with this in view. Any plan, to be successful, must be inclusive in character as regards members of the county medical society, permitting the patients to budget their needs.

There must be some plan provided whereby prolonged illness requiring medical service or needed surgical procedures, will not become a catastrophe. Out of the many plans being tried and widely discussed, we may hope to crystallize medical opinion around feasible principles recognizing that no one plan can meet all conditions in different localities.

Haggard has wisely intimated that medicine, as it grew to be more scientific, lost much of its charm for the people, for as an art and not a science it appealed to the emotions. It seems to be inconsistent to make progress in the sciences and stimulate reverence or adoration.

As we have grown more scientific, whether as doctors or engineers, our contributions are accepted and utilized, but we fail to stimulate the imagination and primeval devotion in the individual which suggests that the art of medicine has declined.

Cultism has thrived in proportion to the lack of interest of physicians in utilizing artistry in the practice. When we think of approximately five hundred million dollars spent annually on self-medication and cultism, by the people of this country, it seems to us fundamental that the profession of medicine as now practiced is likely responsible for a very large proportion of this waste, as well as the harm done, which in many instances, is irreparable.

It is not enough to know the cause of disease which affects a patient, there must be sufficient interest on the part of the doctor to make the patient accept his knowledge and advice.

To hold the people as our friends, we must reincarnate the family physician with his sympathy, homely philosophy and heart-felt interest, that he may again animate the practice of medicine. It has often been said that 85 per cent of the medical needs can be cared for most economically by the family practitioner.

The report recently released by the Committee on the Costs of Medical Care, is significant,

that no one should stimulate a movement toward coercing medicine through social stress as an economic need. It is fallacious to believe that an organized group is immediately endowed with the extraordinary capacity. It depends, after all, upon the members comprising the group, and the amount of individual attention given the patient by the individual doctor, who should be deeply and personally interested. This function can be performed in or out of a group. While medicine has to adapt itself to human needs, we must not lose sight of the first law of nature, which is self-preservation.

Because doctors have felt that healing the sick is a sacred trust, because the very nature of their work requires that they put their time, their strength, their skill and their very life, at the call of humanity, they cannot view with comfort the prospect of a radical change in their present plan of practice. No one knows better than the doctor the need for an intimate understanding of the patient's background. To obtain this information, the physician must often become the possession of the sick individual. The medical profession cannot be mechanized until human beings become machines.

We also believe that it is the function of organized medicine to promote preventive medicine and public health work, primarily this we also believe, is the function of organized medicine to promote preventive medicine and public health work, primarily this means the education of the public. Though statements to the contrary have been made, there has been an abundance of medical leadership deeply interested in magnifying public health measures. Through the units of our organization and our state medical associations, all of the information believed to be acceptable to the public is being constantly and systematically given to the people through professionally supported public health agencies, and by doctors who make popular health radio talks, and through thousands of articles given to the press. All of this is in the interest of public health in an effort to prevent disease.

The American Medical Association early in its career had among its members a few medical statesmen who planned wisely for us. Those of us familiar with the work of our councils and bureaus, not only in education, but in pharmacy and chemistry, and many kindred departments, recognize the far-reaching influence these councils have had in the protection of the people through higher standards in medical education, pure food and drug laws, and the standardization of pharmaceutical preparations.

Pseudoscientific claims, paraded as cures for some of the most serious diseases which affect humanity, are not so boldly exaggerated today as formerly. A well-recognized human trait is optimism, and there are few persons suffering

with a chronically fatal malady who will not believe the most improbable promise of cure.

To combat the vultures who are perfectly willing to prey upon humanity has required more courage and money than the average or small medical society could afford. The American Medical Association has assumed this task and utilizes its knowledge, its accumulated monetary surplus, and its determination to save human beings from such exploitation. Of the numerous suits for libel, tried at a cost of thousands of dollars to the Association, not a single case has been lost. Such protection for the profession and the public is invaluable. Boldly pursuing this policy we make it possible for the secular press to condemn evil practices.

Another function of organized medicine is to foster research and, through new discoveries, increase our knowledge. Research has definitely been encouraged. The American Medical Association provides money for grants which some three hundred workers are now using. To further this phase of endeavor, our organization is well supplied with journals of the first rank.

In magnifying the advantages of the practice of medicine, we have attracted a far greater number of the highest type of young people than can be assimilated at this time. This year, which brought much in educational accomplishment, has evolved material changes in economic values, both in urban and rural sections, creating a mutual problem for the physician and the people.

The number of medical graduates, plus those who come from abroad, now exceeds the mortality of our profession in numbers sufficiently large to be alarming as to the matter of distribution. We recognize the curtailment in population, due probably to artificial barriers interposed both in home life and in restricted immigration laws. This economic problem would seem to be of equal gravity to the medical body and to the public.

Any retardation in distribution of proper medical service in communities is not necessarily the fault of the medical profession. It is more often a characteristic social phenomenon which has always existed. Though this may be a fact, it does not preclude at this time an endeavor on the part of the medical profession to make available its knowledge which could be more widely used. We are willing to cooperate with far-seeing citizens who have become leaders in social welfare activities, in making an attempt to solve the economic necessities, with justice for the physician and adequate medical service for the people.

Adjustments are more necessary now than heretofore, the incidence of diseases so prevalent a few years ago has decreased, some of the diseases have been entirely eliminated, which fact has accelerated the movement of physi-

Medicine of all the arts, is the most exacting. It is a jealous master of the time, opportunity, and capacity of those devoted to its service. In pursuit of the underlying sciences, the art of medicine has sometimes been neglected. It is also true that sequential knowledge, culminating in the large field of sociology and psychology, has become known to an ever-widening circle of humanity.

To adjust the science and art of medicine to the satisfaction of this educated and expectant mass of socially conscious people, will not be difficult when the members of our profession unify their desire to lead those minds which want to control and direct the practice of physicians.

Regardless of our numerous and valuable associations, doctors throughout the country should recognize their need for a strong and militant national medical organization. It is the only body which can truly claim the loyalty of every worthy practitioner. It can concretely express the aspirations and purposes of every follower of Aesculapius who believes in the fundamental principles of ethical medicine.

The American Medical Association has won the respect of its members and informed society. It has been faithful to a trust. Let us give it our unswerving allegiance.

Dignity and economic fairness, as well as conscientious scientific service, depend upon the unity of the medical profession. Ethical standards have held. We have remained true to an ideal. Every appreciative man within our profession realizes his obligation to those who have left a wonderful heritage.

If this organization of ours should fail, medicine as we know it would disintegrate, and if this should ever come to pass, my friends who would suffer more than the people who have learned to respect and trust us?

Medicine must be dynamic, it must be amenable to change in policies as conditions dictate, but change is not always advancement, and medicine must use its best wisdom in making changes, that sound, progressive policies, be adopted.

Medicine may properly establish rules of conduct for its members, but these rules can only be successfully maintained when they correspond to sound ethical principles.

In its ethics, medicine, considering its own affairs, has essentially three purposes in view:

to inculcate ideals, to provide conditions of practice in which there is fair competition among practitioners and to give opportunity, as unrestricted as possible, for individual development.

May I refer to a report made by Doctors Pusey, Follansbee, Sargent, Leland and Cary, at the Conference of State Association Secretaries last November. Although our committee attempted to elucidate many points bearing upon present-day ethical relations, too numerous to recount here, the report was, after all, but a restatement of ideals and gentlemanly conduct, as old as the law of Hippocrates and restated to meet the complexities of our time, being the results of technical changes which are sequential developments of material progress.

The medical profession treasures its ancient home of Hellenic origin. Its straight lines reflect beauty. None of us complain of its architecture, but as time goes by, like all homes, it needs repolishing. Its superstructure stands upon a foundation which time has scarcely marred. The builders of today, like the builders of yesterday, are trying to keep this foundation sound and secure. The portals of this home have always been flung ajar, to extend gracious hospitality to those who need its beneficent bounty. We are proud to claim it as our habitat, and we should protect its beauty, culture and integrity with our lifeblood.

So my friends, when invited to speak to you on this occasion, I chose the subject "The Public and Our Profession." I have endeavored to direct your attention to the value of this great organized profession in the present situation.

In conclusion, I point to the home of our Medical Fathers, wherein their spirit dwells, the readjustment of the present with the past, a clear understanding of society's needs and our usefulness to it, with the abiding thought that, through cooperation and education, the science will progress and its art in the practice of the science will be preserved as an individual blessing for each of the needy souls requiring its ministrations.

MISCELLANY

RECENT DEATH

WATSON — GEORGE MARSHALL WATSON, M.D. of Manchester died at his home December 13 at the age of 65.

for it is based upon certain concepts of society and functions of government. As a nation, we have been developing governmental control to meet social demands without having a definite policy.

The great war left its quota of disabled. It seemed both wise and just to care liberally for the casualties, which was enthusiastically done. Without establishing a definite policy to care for claims which come in the wake of war, Congress yielded to the demands of a group of citizens for broader concessions. From that time on, hospitalization and compensation, with many other far-reaching governmental services were exploited. Social welfare forces became enthused and rapidly evolved plans which became highly suggestive of a more liberal aid for all the people.

At this juncture, the economic situation throughout the country became a paramount issue. While some of us were laboring to create a new policy toward the hospitalization of the non-service disabled veterans, there were other groups, ably represented, attempting to get the government out of business and to force economies which would be far-reaching in effect.

Our profession was represented at the same time before a Joint Committee of Congress, and the medical opinion on these matters was presented. With the change in administration, a courageous leader has been given the power to revamp not only the pay of the government officials but to eliminate vast numbers of gratuities which should never have been allowed. This means that the government will not build contemplated hospitals, for which there have been appropriations but which have not been started. It means the closing of many hospitals now in use, but not well located. It means the opening of some new hospitals which are in process of construction. It means that the non-service disabled veteran, able to pay, will not hereafter become a governmental responsibility. Government hospitals will be utilized for the care of service-disabled veterans, mental and nervous cases, and those veterans afflicted with tuberculosis. Inasmuch as it has always been the government's policy to provide homes for the old soldiers, it is contemplated that the present government hospitals will be used more and more for domiciliary care.

The problem of governmental hospitalization has disturbed the medical profession because it was generally believed that, if not halted, such hospitalization was destined to lead our nation into state medicine. We must be alert to prevent a recurrence of this menace, and not assume that the same forces will remain inactive.

If our country should become prosperous before the present government plan can become a fixed policy, the whole question will be reopened. In Congress, approximately twenty-five claims a day are being presented for pensions, regard-

less of cause of disability. We are not through with such indulgences.

Accumulated data have clearly emphasized the importance of medicine as relates to social needs, such data clearly support our present educational standards. Everyone realizes that there can be no one answer applicable to the varied conditions, social and economic, because conditions change in different environments.

In reply to the suggestion that medicine become more adaptable, Schwitalla has said, "That paradox of adaptation lies perceptibly in this that a measure of isolation spells a continuation of life, exaggerated adaptation means death."

A biological truth to be remembered! He also said, "The organism which adapts itself to its environment with restraint due to self-contained inertia, survives."

The statement has been made that the medical profession of this country has been denied valuable information which is being developed and which is out of harmony with the view expressed in the Minority Report of the Committee on the Costs of Medical Care and elaborated in our own medical journals. I feel that we can deny this charge!

The reaction of the leaders of our organization to the report has been very much the same, and if one cares to investigate, it would be found that the profession throughout the country, has responded in a similar vein. There is nothing more natural than the desire of a great profession to resist change until it has had sufficient time to adjust its mind, if that time should be needed.

The impatience of some of the leaders engaged in social welfare work to hurry the profession to a decision, even going so far as to threaten us with a definite campaign of propaganda to influence the public, is worth noting. I am one of those who believes that it is wise to utilize enough time to crystallize our opinion. The public should recognize that physicians are better able to solve medical questions than anyone else, and that lay opinion, however suggestive and valuable it may be, lacks finality and that essence of true understanding of a doctor's relationship to his patient.

Our organization is striving, through its leaders at headquarters and elsewhere to serve the public and the profession of medicine, first by discussion of problems, secondly, by trial of suggested plans and thirdly, by searching for and finding the truth. Thus will we be able to crystallize the professional mind so that unity will prevail. We all recognize that until there is unity of spirit and professional desire among the members of county medical societies, which are the basic units of our organization, no plan, however far reaching and humanitarian in its aspects, can hope to live without the cooperation of the majority of physicians practicing in the locality covered.

Complications

Cause of Death

Acute infarction of heart. Cholelithiasis
Nephritis Abscess of prostate

Gangrene

Peritonitis

Pulmonary tuberculosis

Fibrous myocarditis

Tuberculosis

Gastric ulcer

Pulmonary tuberculosis

Gangrene Chronic nephritis Coronary
sclerosis

Bilateral pulmonary tuberculosis

Pulmonary tuberculosis

Gall stones

Tuberculosis

Coronary thrombosis Perforation duodenal
ulcer

Coronary thrombosis Perforation
duodenal ulcer

Chronic nephritis

General arteriosclerosis, cerebral
edema

Infarction of heart. Cholelithiasis

Coronary thrombosis

Cerebral hemorrhage Infarcts of heart
lungs and brain Nephritis

Cerebral hemorrhage

Vegetative endocarditis Multiple emboli

Ulcerative endocarditis

Periurethral abscess Intracardiac thrombus

Embolism

Cancer of pancreas

Fibrous myocarditis Multiple infarcts of
heart. Cirrhosis of liver Gangrene of foot.

Coronary sclerosis

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at
Death

Author Age Sex
at
Death

Author Age Sex
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Henle
No 2

Pagel and
Henle
No 2

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3 21 M
4 58 M
5 32 M
6 33 M
7 45 M

1 56 M
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33 56 F
34 14 M
35 68 M
36 27 M
37 39 F
38 62 M
39 65 M
40 73 F

THE ASSOCIATION OF DIABETES AND TUBERCULOSIS*

II Pathology and Etiology

BY HOWARD F ROOT, M.D.†

A Pathology

- 1 Preface
- 2 Series of autopsies
- 3 Incidence of active pulmonary tuberculosis at autopsy
- 4 Types of pulmonary tuberculous lesions
- 5 Extrapulmonary tuberculous lesions
- 6 Non-tuberculous pathology
- 7 Causes of death
- 8 Quiescent and healed lesions
- 9 Comparison with tuberculous lesions in non-diabetics
- 10 Tuberculosis in the Negro and diabetic

B Etiology

- 1 Bacteriology of tubercle bacillus
 - a Variation in form
 - b Cultural and metabolic characteristics in relation to diabetes
 - c Virulence
- 2 Immunity of the diabetic
- 3 Allergy and resistance
- 4 Contagion
- 5 Summary

1) PREFACE For a study of the pathologic changes found at autopsy in cases of combined diabetes and tuberculosis, the records antedating 1900 are of comparatively little value, and unfortunately even in recent reports details are not profuse. One is forced to conclude merely from the lack of statements to the contrary that the microscopic appearances of tuberculosis as found in the diabetic show no peculiarities which would distinguish it from non-diabetic tuberculosis. The distribution of tuberculous lesions, the frequency of certain of its forms, the rapidity of its course and the ages of the patients have been the most frequent subjects of comment.

2) SERIES OF AUTOPSIES In table 1 are included five series of diabetic autopsies in which evidences of healed or active tuberculosis were found. The selection of these series was dictated by the fact that either some details were given as to the clinical and diabetic records or else that sufficient data were given regard-

ing the lung findings and the extrapulmonary findings to enable some conclusions to be drawn about the types and locations of tuberculosis. The older reports of autopsies are for the most part merely reported in summary. Even the series of Naunyn¹ includes patients autopsied in the latter part of the 19th century. Such a series cannot be compared with autopsies performed upon patients dying since 1918 with respect to the incidence of tuberculosis owing to the tremendous change in social conditions and in the types of hospitals which now allow for much greater segregation and isolation of tuberculous patients than was formerly the case. However his series may be used in considering the types of lesion found within the lungs.

a The first 15 autopsies were performed at the New England Deaconess Hospital, Boston, Massachusetts since 1923. The Deaconess Hospital takes private patients mainly and the series represents elements in the population as a whole which might be absent from a series drawn exclusively from the wards of a public or municipal hospital where the patients were for the most part from the unfortunate and from the crowded districts of the city. Thus, there are only 7 cases of tuberculosis causing death in 150 autopsies, 3 with small active lesions not the cause of death, and 5 with healed lesions.

b Sauerbeck's² series belongs to an older period. No details are given as to the type of pulmonary tuberculosis although it seems evident from his article that the pulmonary tuberculosis was probably the cause of death. The series is included because he gives descriptions of the pancreas and particularly of the islands of Langerhans.

c Naunyn's¹ series is taken from 49 autopsies apparently performed in the great public hospital in Strassburg prior to 1906. These series, however, should not be included in any comparison of diabetic and non-diabetic autopsies done in the last ten or twelve years.

d Pagel and Henke³ report two series of autopsies. The first is from the Pathologic Institute of the University of Berlin consisting of 101 diabetic autopsies performed since 1918. It includes 15 cases of active tuberculosis and 13 cases classified as inactive and non-advancing. The second series of 40 cases is taken from 164 diabetic autopsies at a large hospital in Friedrichshagen near Berlin.

e Montgomery's⁴ series of 7 cases from Philadelphia was described in 1912.

f Dr Shields Warren has given me 10 cases

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†Root—For record and address of author see "This Week's Issue," page 109.

series only healed processes are present. The duration of the diabetes as well as age at death are known in the Deaconess Hospital series. Case No 1257, female, aged 78 years, is notable in that her tuberculosis remained healed in spite of having diabetes for 25 years. Case No 3134, female, aged 73 8 years, also exhibited bilateral scars in both apices after diabetes of 45 years. Case No 4284, male, 71 5 years, and Case No 4862, male, aged 64 8, both with healed apical lesions had had diabetes only 4 7 and 7 8 years, respectively. Pagel and Henke's case No 28, male, 62 years, had a calcified focus at the right apex. In contrast to these aged patients, Pagel and Henke's Case No 3, female, aged 31, is described as "not active."

The proportion of cases with healed lesions in relation to cases with active lesions is so extraordinarily small as to indicate clearly that only frank, outspoken healed lesions have been noted. Small areas of pleural thickening, pleural adhesions, small calcified foci must have been disregarded. That the occurrence of healed tuberculosis in diabetics is really infrequent must not be inferred from these figures. We believe that tuberculous infection in diabetics is just as frequent as in non-diabetics (as indicated by the von Pirquet or Mantoux tests in childhood) and that the x-ray evidence of calcification in tracheobronchial glands and in small foci within the lungs, found in 70 per cent of our diabetics in the Deaconess Hospital has the same significance as indicating healed or healing tuberculous lesions as in non-diabetics.

b) In only 56 cases of this series are the pulmonary lesions described in such detail as to leave little doubt as to the presence or absence of cavitation. Of these, 28 had cavities, an incidence of 50 per cent. Single or multiple cavities occurred in upper or lower lobes. Large cavities were present in 3 children out of 9, Deaconess Hospital Case No 7041, boy 14 8 years, Naunyn's Case No 21, boy, 17 years, and Naunyn's Case No 30, boy, 12 years. In the adults, cavitation was frequently associated with chronic tuberculous lesions of the intestine and in five instances of the larynx or trachea.

In 40 cases listed by Pagel and Henke the pulmonary lesions are described only as "ulcerative" or "productive." A brief interpretation of these terms is necessary. Under "ulcerative" they include tuberculous lesions characterized by necrosis, ulceration and frequently leading to cavitation. "Exudative" lesions such as tuberculous pneumonia which may resolve or go on to necrosis, ulceration or cavitation are also included. By "productive" is meant the lesions best typified by milary tuberculosis. The lesions consist of a multiplication of cells, the formation of tubercles usually widespread but not necessarily so. Forty-three out of 50 cases are listed as "ulcerative." Doubtless many of these had cavitation.

c) Caseation. Diabetic tuberculosis has often

been described as characterized by large rapidly extending areas of caseation. The term is applied to a form of coagulation necrosis characteristic of non-diabetic tuberculosis as well in which the dead tissue has an appearance quite similar to that of cheese. Just as cheese is a mixture of coagulated protein and finely divided fat, in caseation there is a coagulation of tissue proteins associated with the deposition of considerable quantities of fat. Again we are reminded of the disordered fat metabolism of the diabetic. The protein material is almost solely coagulated protein, which in its elementary composition is related to the simple proteins or to fibrin. Possibly the tubercle bacillus produces substances coagulating proteins. Auclair (quoted by Wells and Long) claims that the fatty substance that can be extracted from tubercle bacilli by chloroform is the cause of the caseation. The phosphatide fraction of the lipoids studied was particularly potent in producing giant cells of the Langhans type. However, Wells and Long⁷ conclude that studies so far fail to show that materials extractable from the tubercle bacillus tend to produce the typical massive caseation necrosis. One cannot escape wondering whether the well-known diabetic tendency to fatty degenerative changes in the arteries and liver also favors caseation. No chemical studies are available. In the 55 detailed autopsies of this series, caseating processes are mentioned in 32. However, the incidence of caseation is probably much higher, especially if the term "ulcerative" be assumed to include caseation. In fact, probably a fairer idea of the frequency of caseation is obtained by considering only the autopsies of the Deaconess Hospital. If only the 10 cases with an active process be included, caseation was present in 7 or 70 per cent.

The caseation noted in the above-mentioned 32 cases may be summarized as follows:

Glands alone	1
Glands with other processes	5
Small caseous pulmonary foci only	8
Caseous pneumonia	10
Caseous foci with cavities	8

In the seven Deaconess Hospital cases with advanced processes, the apices were involved by caseating processes in each case. Cavities were present in either or both upper lobes in six cases. In Case No 7041, boy, 14 years, cavities were found in all five lobes. In Case No 1977, female, 81 2 years, although caseous nodules were present in both apices there were no cavities. In Cases Nos 6791 and 6809 cavities occurred in the right lower lobes as well as the right upper. The distribution suggests that apical and subapical caseous lesions with or without secondary infection resulted in cavitation and a bronchiogenic spread to lower portions of the lungs.

d) "Non sensitized" tuberculosis resembling the overwhelming primary tuberculosis of the

child has been considered characteristic of adult diabetic tuberculosis. It is worth noting that Opie⁸, in studying the tuberculosis of Negroes, found that although the usual forms occurred in many cases, in over one-half the autopsies, characteristic lesions of a first infection appeared. Thus, these lesions did not arise at the apex, massive enlargement of the tracheobronchial glands with caseation occurred and there was no evidence of healing or healed scars in

tuberculosis was rarely recognized in a diabetic until an advanced or even terminal stage had been reached.

f) The apices were involved in all the Deaconess Hospital cases. In five of Lundberg's¹⁵ 14 cases, cavities were found in the upper lobes.

g) Miliary tuberculosis occurred in seven cases. This type is so characteristic that it is safe to assume that this represents its incidence in the entire series of 126 cases. (See table 3.)

TABLE 3
SEVEN DIABETIC AUTOPSIES WITH MILIARY TUBERCULOSIS

Author	No	Age	Sex	Sites of Lesions
Pagel and Henke	1	26	M	Slight tuberculosis right kidney, miliary in bone marrow
Pagel and Henke	18	23	M	Extensive cavities in lungs caseous peribronchial areas and miliary lesions larynx, intestine, liver, spleen and kidneys
Montgomery	1	51	M	Lungs and spleen also bronchopneumonia
Montgomery	3	21	M	Lungs, pleurisy, bronchial and mesenteric glands
Warren	9	58	M	Fibroid, and "early miliary" in lungs
N E D H	7041	14	M	Chronic in lungs with many cavities Miliary in kidney, spleen liver peritoneum
N E D H	6809	33	M	Chronic in lungs with terminal miliary lesions in lungs

the lungs or lymph nodes. Caseous pneumonia and caseation of the tracheobronchial glands were especially noted. If the detailed protocols of the seven Deaconess Hospital cases with advanced processes be consulted four cases will be found with caseating bronchial or abdominal glands.

a) Case No 7041, aged 14 7 years, numerous cavities in both lungs with intestinal and peritoneal tuberculosis.

b) Case No 6791, aged 41 5 years, cavities in right upper and lower lobes, with caseous hilum and mediastinal glands.

c) Case No 1977, aged 80 years, apical tuberculosis with caseous glands in celiac region.

d) Case No 11471, aged 48 years, old right apical cavity with rupture into bronchus, caseous bronchial nodes. An old calcified primary focus near the pleura.

All these cases had apical lesions with terminal extensive disseminated tuberculosis. The unusual feature is the occurrence of caseating glands. This similarity of the lesions in diabetics and Negroes is of interest when it is remembered that the tuberculous mortality rates for Negroes is 3 2 times greater than for whites in the United States.

e) Pneumonia occurred in nine of the 55 cases. In most instances caseous pneumonia was associated with cavitation in another lobe. As early as 1884, Dreschfeld⁹ reported acute tuberculous bronchopneumonia, running a more rapid course than ordinary phthisis and causing early cavity formation in diabetics. This conception of diabetic tuberculosis has been greatly overemphasized because in the past tu-

miliary tuberculosis was clearly but a terminal event in a chronic, advanced process in the two Deaconess Hospital cases, in Warren's case and in Pagel and Henke's Case 18. In Pagel and Henke's Case 1, the lesions were not the cause of death. Montgomery's two cases remain the only ones in which it is possible to suppose that a miliary process developed with special rapidity because of the presence of diabetes. Two other instances without autopsy examination occurred among the Deaconess Hospital patients. Case No 4045, physician, aged 60 years at onset of diabetes, had pleurisy with effusion, developed acute miliary tuberculosis six months later and died at the age of 61 years. Case No 2687, female aged 24 years at onset of diabetes, had coma repeatedly, developed acute miliary tuberculosis with pneumonic symptoms and a positive sputum and died at the age of 30 years.

5) EXTRAPULMONARY TUBERCULOUS LESIONS (Clinical reports chiefly)

Pleurisy appears in all its forms in diabetes. At autopsy, pleural adhesions were found in all cases with pulmonary tuberculosis. Pleural effusion was present in Case No 3686, male, aged 67 years, and Case No 3898. Ritter's¹⁰ case had double pleural effusion. Pneumothorax appeared in one of Ritter's cases and in at least three cases at the Deaconess Hospital. McCormick¹¹ and Montgomery⁴ each noted one case of effusion. Case No 4743, aged 15 at onset of diabetes in 1923, developed tuberculosis with pneumothorax and bronchial fistula in 1931.

Larynx and Intestine The larynx was involved in but three instances in the series in ta-

ble 1 However, the larynx was not examined postmortem in the Deaconess Hospital series, and probably not in most of the other cases

Case Nos 3817 and 3995 in the Deaconess Hospital series had laryngeal tuberculosis Montgomery noted a patient with laryngeal involvement attending the Phipps Institute Dispensary In Rubin's¹² group of 526 fatal cases (non-diabetic) from the Montefiore Home, New York City, 90 per cent of those cases complicated by laryngeal tuberculosis had tuberculous ulcers of the intestines Nearly 50 per cent had other tuberculous lesions in addition to those in lungs, larynx and intestine By contrast the co-existence of other foci of tuberculosis with pulmonary disease in diabetics is less frequently reported Rubin remarks that tuberculosis of the intestine is more common in the caseating type of tuberculosis than in the chronic In fact he states that among 604 patients including 42 diabetics with pulmonary tuberculosis that the laryngeal-intestinal complication was less frequent in the diabetics of similar age than non-diabetics Tuberculous ulcers in the intestine were found twice in 92 autopsies on diabetics reported by Seegen, the lungs being tuberculous in 40 cases By contrast Brown and Sampson¹³ also report that 50 to 80 per cent of patients dying with tuberculosis have intestinal lesions

Oberle's¹⁴ diabetic case had tuberculous ulcers of the cecum, larynx and palate as well as pulmonary lesions Case Nos 3358, male, aged 44 at death, 5966, female, aged 37 at death and 6809, male, aged 33 at death among the Deaconess Hospital cases had intestinal tuberculosis The contrast between diabetic and non-diabetic is brought out by comparison with figures of Ophuls In the first place nearly 10 per cent of all his cases of active tuberculosis were intestinal Active intestinal tuberculosis without active pulmonary tuberculosis is practically unknown in the literature of diabetes

Meninges and Brain Among 126 cases in table 1, not a single case of tuberculosis of the brain or meninges is present Isolated cases are found in the literature, as Rokitsansky's case of meningeal tuberculosis cited by Seegen¹⁵, De Jonge's¹⁶ case of tuberculous involvement of the medulla oblongata, Ritter's case of meningitis, and Drummond's¹⁷ report of a solitary tubercle of the brain in a seven-year-old child with Jacksonian epilepsy The total number of autopsies upon diabetic children with tuberculosis in table 1 is nine, and of these none had meningitis Steinmeier¹⁸ found tuberculous meningitis in 132 cases out of 7231 non-diabetic autopsies and 10 per cent of all cases of active tuberculosis In 186 autopsies upon children under 15 years of age, meningitis occurred in 69 or 37 per cent Ophuls in San Francisco found meningitis in 12 per cent of all his cases of active tuberculosis In the first decade about one half of all

cases of active tuberculosis tend to terminate in active meningitis Involvement of meninges and brain in the diabetic in comparison seems conspicuously rare

Liver In table 1 four cases showed tuberculosis of the liver as part of generalized infection. Seegen reports two cases in 92 autopsies and one case out of 30 in Rokitsansky's series

Spleen Miliary tuberculosis of the spleen has been reported by Bagou¹⁹ A questionable diagnosis of tuberculosis in the spleen was made on one of Montgomery's cases and in table 1 the spleen was involved in three instances

Kidneys Naunyn had 2 cases Williamson had one in 20 autopsies and Seegen reports one case out of 92 In table 1 are found five cases Again the infrequency of renal tuberculosis in diabetes stands out in contrast to the non diabetic

Adrenals Montgomery described one case in a diabetic and Ogle²⁰ found a case so considered by Naunyn Case No 5434 a physician, aged 38 years, died of Addison's disease

The Peritoneum Four cases of peritonitis are found in table 1 Case No 4296, aged 26 at onset of diabetes, developed tuberculous peritonitis at the age of 34 years Ascites was extreme during her observation in the Deaconess Hospital in May, 1932, but in October, 1932 her husband, a physician, stated that she had improved

Lymph Nodes The records of tuberculous adenitis in diabetes are especially unsatisfactory In table 1 tracheobronchial glands were involved in 11 instances and the mesenteric glands in 10, but undoubtedly the records are incomplete In the nine Deaconess Hospital autopsies presenting active lesions, caseous tracheobronchial glands were present in two and caseous mesenteric glands in two The incidence of tuberculous adenitis in diabetes is better shown by the frequency of calcified tracheobronchial glands demonstrable in a large series by x-ray In 1659 cases (see Chap I, *New Eng J Med* 210 8 [Jan 4] 1934) the incidence was 77 per cent Including the cases with accompanying pulmonary lesions the incidence of healed and active tuberculosis becomes 79 per cent, which is comparable with Ophul's finding of 75 per cent of his entire autopsy series (3000 cases) presenting either active or healed tuberculosis

Cervical adenitis is not recorded at autopsy

Other organs The bones are rarely found tuberculous in diabetes In table 1 one case had miliary tubercles in the bone marrow In addition may be mentioned one case of tuberculous spine in the Lakeville Hospital in Massachusetts in a male 50 years of age who had had dia-

betes for 17 years and tuberculosis for one year

Case No 1616, male, aged 14, had a chronic swollen finger joint with a tentative diagnosis of tuberculous dactylitis but without pathologic proof His finger healed Case Nos 3040 and 5661 had tuberculides of the skin

Of Tompkins's²¹ 13 cases of combined tuberculosis and diabetes one had tuberculous epidydmitis

6) NON-TUBERCULOUS PATHOLOGY

Pancreas The size and weight of the pancreas are of little significance owing to the varying degrees of fatty infiltration and fibrosis The average weight for 18 cases in table 1 was 81 grams, the extremes being 30 and 120 grams In 13 additional cases the size is given as normal and in 8 the pancreas is described as small or atrophic

Hyalin changes in the islands of Langerhans were mentioned in 12 cases The youngest case with hyalin islands was 43 years of age Sclerosis of the islands was described in 12 cases Interstitial pancreatitis occurred in one Incidentally, Ackman and Ross²² describe a diabetic man with pulmonary tuberculosis and multiple pancreatic calculi Acinar sclerosis was present in 17 cases Calculi occurred twice and cancer once Lymphocytic infiltration was present once In no case was the pancreas involved by tuberculosis Nine are described as normal Warren²³ found 69 normal pancreases in 259 diabetic autopsies In general the pancreas showed only those changes in the islands of Langerhans and the acinar tissue which usually accompany diabetes

Glycogenic infiltration in the epithelium of the renal tubules was present in two cases The distribution of glycogen in diabetic tuberculosis is deserving of special study Pinner²⁴ found glycogen in experimentally-produced tubercles, localized either in leucocytes or in the epitheloid or giant cells Livers studded with tubercles seemed to contain less glycogen in their parenchymatous cells than a normal organ, but liver cells bordering on necrotic tubercles contained more glycogen than similar cells further removed from the foci Pagel and Pagel²⁵ found the exudate cells in caseous pneumonia free from glycogen, but glycogen was present in the cellular borders of tubercles In diabetes the distribution of glycogen in skin, liver and muscle varies according to the control of the diabetes and is especially influenced by severe infections Rabuchin²⁶ studied experimental tuberculous animals They showed a tendency to productive and proliferative processes in the pancreas with, finally, sclerosis and atrophy of the islands of Langerhans The livers also contained little glycogen. Possibly an understanding of glycogen metabolism would supply the

key to the problem of how diabetes lowers the resistance of tuberculous infection

Other Organs Arteriosclerosis was prominent in the Deaconess Hospital cases, owing partly to their greater age and longer duration of diabetes However, even the youngest Case No 7041, aged 14 8, showed atheromatous plaques in the aorta In nine others arteriosclerosis is mentioned, associated with atrophy of the heart (1 case) cirrhosis of the liver (3 cases), coronary sclerosis and myocarditis (1 case) and myocarditis, nephritis, renal arteriosclerosis and hepatic cirrhosis (1 case) Unfortunately no data with respect to arteriosclerosis are available for most of the cases The existence of chronic nephritis in five others suggests the presence of arteriosclerosis as well

Coronary sclerosis with infarction of the heart occurred in six of the 15 Deaconess Hospital cases and gangrene of a foot in three Case No 6809 was but 33 4 years of age when he developed gangrene

Arteriosclerosis and tuberculosis in diabetics both exhibit a marked tendency to calcification Even in diabetic children, calcification of the arteries of the legs visible by x-ray occurs Calcium deposition, according to Wells and Long²⁷, seems to depend rather on physical than chemical attraction, for it tends to occur in hyalin or homogeneous colloidal masses of whatever chemical nature occurring anywhere in the body Tubercles undergo calcification probably because they present these physical conditions rather than because of any chemical constituents The large amount of phosphoric acid that might be derived from the disintegrating nuclei of the necrotic tubercle cannot be held responsible, for Wells found that implanted sterile tissues rich in nuclei take up no more calcium than do tissues poor in nuclei The chemical composition of the calcific deposits in tuberculosis differs not at all from those occurring in other pathological conditions In the next section is shown the distribution of areas of calcification in the lungs of diabetics as shown by x-ray Certainly no failure in calcification is suggested as an explanation of the poor resistance of the diabetic to tuberculosis

7) CAUSES OF DEATH In 69 cases for whom the facts are given, tuberculosis was the cause of death in only 35 Coma was responsible for 11 deaths (including here two deaths designated as "diabetes") Most of these belong in the period before the discovery of insulin None of the Deaconess Hospital cases died of coma, all autopsies having been performed since the use of insulin.

In 17 cases the tuberculosis was not sufficiently active or advanced to have played much part as a cause of death In this group the causes of death were diabetes and coma (3), embolism (2), coronary thrombosis (3), meningitis (2),

otitis media and operation (1), pneumonia (1), gangrene of lung (1), cerebral hemorrhage (1), acute ulcerative endocarditis (1), arteriosclerosis (1), adenocarcinoma of pancreas (1)

In six cases active pulmonary tuberculosis was present, but was overshadowed as a cause of death by gangrene of an extremity (1), acute septic processes (2), cirrhosis of the liver (1), nephritis (1) and arteriosclerotic changes

8) **QUIESCENT AND HEALED LESIONS** In addition to the 17 cases in which relatively inactive tuberculosis was present, Warren's case 10 had a fibroid process which might have persisted for a long period except for the onset of coma Dorendorf²⁷ also comments upon the frequency of old fibrotic processes in mild diabetics In five of the Deaconess Hospital cases (included in the 17) only healed apical lesions were present The use of roentgenograms is revealing more early cases with the result that clinical healing of tuberculous cavities and pneumonia is being observed Wessler and Hennel²⁸ recently reported eight cases of active pulmonary tuberculosis in diabetics with healing of cavities and extensive exudative lesions under observation Abundant evidence exists that healing may occur and that even moderately advanced processes may remain stationary for long periods in diabetic patients under modern treatment

9) **COMPARISON WITH TUBERCULOUS LESIONS IN NON-DIABETIC** Postmortem examination of diabetic patients reveals no single type or stage of tuberculosis Small healed foci, small caseous areas in either the lungs or lymphatic glands, more extensive healed or fibrotic areas in the apices are not infrequent Where death is due to tuberculosis the involvement is frequently extensive with cavitation and terminal pneumonia or miliary spread and often presenting in the background the characteristics of a chronic infection Comparison with non-diabetic tuberculosis may be made with respect to the primary infection, the type of progression, the types of lesions found and character of reaction to tuberculous infection

a) *Primary tubercle* No evidence exists that the primary tubercle differs anatomically in the diabetic from its form in the non-diabetic It may heal by resolution leaving no trace, or by fibrosis and calcification or ossification Such areas of calcification in the parenchyma are frequently observed in diabetes They may be single or multiple and are observed in any lobe, most frequently out toward the periphery (See Chap III, *New Eng J Med* 210 [Jan 18] 1934) In fact, such areas of calcification were found in 76 out of 87 roentgenograms in diabetics at the Deaconess Hospital

b) *Cervical Lymph Nodes* Granting that a simple method of mass infection is one from

hand to mouth, the establishment of primary foci in the deep cervical lymph nodes may be expected No autopsy data for diabetics have been found However, Case No 2448, male, aged 18 at onset of diabetes, had draining tuberculous cervical glands at the age of eight years The apices were dull to percussion at the age of 18 years Pulmonary tuberculosis was found at the age of 19 6 years and he died at the age of 24 years with an extensive exudative process (See Chap III, *New Eng J Med* 210 [Jan 18] 1934 for x-ray) Case No 10887, aged 33 7 years at onset of diabetes had large calcified cervical glands In a few cases, that also had pulmonary tuberculosis, calcified cervical glands were noted by x-ray Tuberculous adenitis was treated surgically in Case No 2007 Case No 9975, aged 25 years at onset of diabetes, had tuberculous cervical adenitis in childhood She went through a normal pregnancy in 1932 Case No 7432 had tuberculous cervical glands at six years and at 16 years chest films showed suspicious markings Undoubtedly careful search as emphasized by Grabfield and Miller²⁹ would reveal many more cases of cervical adenitis and the site of primary infection would thus be placed much more frequently in the appendages of the mouth and nasopharynx

At this point bovine tuberculosis should be considered since it has been shown to be the cause of from 38 to 61 per cent of the cases of cervical adenitis before the age of 16 years I have found no reports of bovine tuberculosis in diabetics Calcified mesenteric glands are frequently demonstrated by x-ray, at operation or at autopsy

c) *Mesenteric Lymph Nodes* The lymph nodes in association with the intestinal canal should show evidence of disease where large numbers of tubercle bacilli are entering the body by this pathway Opie found that the frequency of such lesions varies in different parts of the world, and explained the disparity of the incidence of mesenteric lymph node disease between American and English subjects as due to the well-recognized difference in the frequency of bovine tuberculosis Opie has also observed that "when healed lesions are present in the mesentery, focal tuberculosis of the lung is seldom found First infection with tuberculosis may occur by way of the lungs or by way of the gastrointestinal tract and the occurrence of one lesion tends to prevent the other"

Among diabetics at the Deaconess Hospital, calcified mesenteric glands were noted only in Case No 4284, aged 71 5 years, at death Case No 1977, aged 81 2 years had caseous mesenteric nodes, as did Case 7041, aged 14 8 years, but both died with extensive and acute tuberculosis Clinically tuberculous mesenteric glands have been recognized in Case No 3271, aged 33 years operated upon for supposed acute appendicitis Case No 4763, aged 16 years whose

calcified glands appeared by x-ray and who later developed pulmonary tuberculosis was suspected of appendicitis. Case No 11222, aged 19, and Case No 4688, aged 11, were operated upon for attacks of abdominal pain and vomiting.

Caseous mesenteric glands were more frequent at autopsy in the cases from European hospitals. Thus Naunyn's Case 49, and Pagel and Henke's Cases 30, 46, 48, 55, 57, 63, 96 and 100 showed active involvement of the mesenteric glands accompanying active pulmonary processes. There is little evidence to suggest the frequency of primary intestinal tuberculosis in diabetics.

d) *Secondary Tuberculosis Apical Tuberculosis* More or less localized areas of induration and atelectasis at one, or, more often both apices, usually accompanied by dense pleural adhesions are frequently found in the lungs of modern city dwellers. In this country the incidence is probably less than in Europe, perhaps about 20 per cent, as suggested by Opie's studies on 74 white adults. At the Deaconess Hospital healed apical lesions were only recorded in six cases. In this same series only 7 cases of extensive tuberculosis and 3 cases with small active foci occurred. Roentgenograms show a much greater incidence of apical scarring, and indeed of active apical tuberculosis accompanying a process elsewhere in the lung. Sosman²¹ reported 16 cases of healed apical tuberculosis in 182 diabetic patients studied by x-ray.

Apical tuberculosis may be regarded as caused by endogenous or exogenous reinfection. Accepting the first hypothesis, one must suppose that during caseation or softening of tracheobronchial nodes bacilli escape into efferent channels leading to the thoracic duct, thence to the venous blood and back to the lungs. The proponents of exogenous infection cite observations to indicate the rarity of apical secondary disease before the eighteenth year and argue that if the primary foci have become established at the fifth or sixth year it is logical to assume that metastases to the apices should have occurred earlier.²² In seven autopsies upon tuberculous diabetics reported by Lundberg²³ cavities in one or both upper lobes with adhesions of the apices and parietal pleura were present in six. Case No 7041, aged 14.8 years, had cavities in both upper lobes. Case No 5932, male, aged 17 years showed by roentgenogram extension to the right apex subsequent to a lesion in the left middle lobe. This extension occurred while he was under observation and treatment in a tuberculosis sanitarium. Case No 7263, female, nurse, aged 28 years developed soft hazy infiltration of the right apex extending from just above to just below the clavicle, two years after a roentgenogram showed calcified tracheobronchial nodes. Furthermore, in 87 roentgenograms of diabetics with pulmonary tuberculosis the subclavicular region was involved in nearly all. On the other hand, several factors may

tend to prevent the immediate establishment of apical disease according to Baldwin, Petroff and Gardner.²⁴ Under experimental conditions a freshly acquired primary infection results in such a high degree of sensitiveness that relatively large reinfecting doses administered by inhalation produce only slight permanent disease in the lungs. However, a single small dosage, when repeatedly discharged into a given area of hypersensitive tissue over a prolonged period, will ultimately cause reactions of a very chronic type (Krause²⁵). Finally, it should be borne in mind that intercurrent diseases like whooping cough, measles, etc., exert a definite and well-marked influence upon latent foci of pulmonary tuberculosis. It is possible that diabetes and especially acidosis may have such an accelerating effect. Under the irritation of such concurrent diseases, inflammatory reaction and particularly edema in the walls of pulmonary and tracheobronchial lymph-node tubercles may increase their permeability so that tubercle bacilli once more escape from them.

e) *Dissemination* From any actively softening area, organisms may spread by way of the thoracic duct and the venous blood, or more serious still, by way of the arterial blood to all parts of the lungs or body. Bronchiogenic dissemination occurs when invasion of the walls of a bronchiole leads to ulceration. Tubercle bacilli and caseous tissue elements gain access to the duct system of the lungs and a bronchiogenic dissemination is the result.

f) *Types* Much importance has been ascribed to the difference between proliferative and exudative types of pulmonary tuberculosis. Diabetic tuberculosis has been described as marked by exudative pneumonic processes. Massive pneumonic infiltrations, such as are found in overwhelming primary infections in childhood have been regarded as typical, especially by Sosman. Undoubtedly both proliferative and exudative types occur in diabetics, sometimes alone and sometimes in combination. So far as the 126 autopsies (table 1) are concerned by far the greater majority of the cases, sufficiently extensive to have caused death, are to be regarded as chronic ulcerative pulmonary tuberculosis with more or less acute terminal conditions. Among 40 cases cited by Pagel and Henke and definitely classified as ulcerative or productive, only seven were of the productive type. As a rule cases of fatal tuberculosis exhibit cavitation in one or both the upper lobes with much sclerotic tissue about it. In the lower lobes are found various manifestations of its spread, proliferative or exudative with their sequelae. Thus cavities are often multiple. Clusters of tubercles and patches of pneumonia may occur. Gelatinous pneumonia as in Case No 11471 may be extensive. Miliary lesions in one or more lobes may occur as in Case No 6809 due

to invasion of a branch of the pulmonary artery

The dictum of Koch that there is "no conformity to rule in tuberculosis" indicates how easily one may be led to make conclusions that certain forms of tuberculosis are peculiar to diabetes on the basis of a few observations which would not be borne out if the course of the disease had been observed in a larger number of cases throughout its various stages

The rarity of acute, generalized tuberculosis in diabetics such as occurs in childhood is striking. Tuberculosis of the meninges, pericardium, pleura, peritoneum or joint surfaces is uncommon. The comparative infrequency of tuberculosis as a cause of the death in diabetic children has been due to their early death from other causes. Warren gives 21 autopsies upon diabetic children from 15 to 16 years of age without a single case of tuberculosis. Page and Warren add six cases from 16 years to 20 years without tuberculosis. The average duration of diabetes was less than one year! By contrast Naunyn's four diabetic children, reports of whom were published in 1906, all had tuberculosis at autopsy. In Ophuls' series of non-diabetics, on the contrary, if we exclude the healed cases, 43 or 11.8 per cent of all children in the first decade and 13, or 17.9 per cent of those in the second decade had tuberculosis.

However, since diabetic children no longer need to die of coma, they may, by living longer, more frequently develop tuberculosis in the future. So far the localization of active tuberculosis in the lungs has been very striking in the diabetic child.

In Ophuls' non-diabetic series there were 237 cases with active tuberculosis in the lymph nodes or nearly 10 per cent. In diabetics, active tuberculosis in the lymph nodes is rare except with extensive pulmonary tuberculosis. In Ophuls' 632 cases of active tuberculosis 16 per cent were non-pulmonary, whereas in this diabetic series only three cases, or two per cent, were non-pulmonary. Bones, joints and tendons were involved in six per cent of Ophuls' series of active tuberculosis, the primary focus in these cases being in the lungs in 70 per cent. Bones, joints and tendons are rarely involved in diabetics.

10) TUBERCULOSIS IN THE NEGRO AND DIABETIC. The susceptibility of the American Negro to tuberculosis of unusual form and frequency has long been noted. Opie's³⁴ study deals with the epidemiology and pathologic changes. Pinner and Kasper³⁵ review an extensive literature and report a comparison of postmortem observations in 303 Negroes and 219 white patients dying of tuberculosis. A comparison of their findings with those in diabetics is of interest. Miliary tuberculosis is more frequent in Negroes than in whites at all ages, but especially in early

childhood. Miliary forms (excluding the terminal type) are rare among diabetics. Hematogenous metastases, occurring in 84.2 per cent of the Negroes seem no more frequent among diabetics than among non-diabetics. Massive lymph-node caseation and massive exudative lesions in the lungs seem characteristic of Negro tuberculosis and in this respect a certain similarity to tuberculosis in the diabetic appears. Pinner feels that, in the Negro, lack of childhood infection is not the explanation. Infection produces a high state of allergy in the Negro but with little coincidental increase in resistance. The diabetic seems to have had normal resistance, judged by the number of calcified foci remaining from early infection, but in some manner loses his resistance after the onset of diabetes.

B ETIOLOGY (A REVIEW)

1) BACTERIOLOGY. Certain features of the biology and bacteriology of the tubercle bacillus have a special bearing upon diabetic tuberculosis. Thus it has repeatedly been stated that tubercle bacilli are less often and with more difficulty demonstrated in the sputum than in non-diabetic tuberculosis. We have not confirmed this finding in the present series. Inheritance plays an important part in the etiology of diabetes and the idea has been advanced that in diabetic families a similar hereditary tendency to tuberculosis exists. The marked tendency to rapidly caseating and acute pneumonic processes repeatedly mentioned in the literature suggests some peculiarity in the diabetic tissue especially suited to the metabolic needs of the organism, or possibly to certain phases of its growth. However, it is easy to emphasize chemical and bacteriologic features at the expense of epidemiologic factors.

a) *Variation in Form of Tubercle Bacillus*. Wells and Long³ from whose review I quote freely, have summarized the evidence indicating that the bacillary form is but one phase of the life of the tubercle organism.

A life cycle including a stage utterly invisible by any method, a finely granular phase, a coarsely granular phase and finally a mature, stable bacillary form, has been accepted by many workers in the field. Various types of pathologic change have been linked with these different forms. In recent years the granular phase has received as much attention as the filterable or bacillary forms, the granules being credited with reproductive character analogous to that of the nucleus in animal or plant cells. Opponents of the school of polymorphism have claimed that many of the forms described were contaminations, which in many instances may easily have been the case, but the importance of the granule, so much like that occurring in the structure of

the ordinary acid-fast rod, seems generally accepted

A type of variability not previously suspected in *Mycobacterium tuberculosis* was discovered by Petroff and his collaborators in applying to the growth of the tubercle bacillus the teaching of Hadley and others on microbial dissociation. Under special conditions they were able to isolate rough forms with a notable variation of virulence with the character of the colony. Differences in chemical composition of the rough forms as well as certain biological differences have been detected.

As yet no series of observations indicating unusual forms of the tubercle bacillus in diabetics have been found. We have not been struck by the variety of the usual acid-fast bacilli in active diabetic tuberculosis. Thus, in our series of 245 cases, 109 had positive sputa. This percentage seems low, but it must be remembered that only 160 were under observation in a hospital at a period when tubercle bacilli might be found. The others developed tuberculosis after being treated for diabetes, or were seen but a single time in consultation. Furthermore among the 160 were a considerable number who remained at the Deaconess Hospital but a few days before transfer to a tuberculosis hospital. The number of positive sputa does not seem extraordinarily low under these conditions. Wassmund³⁸ reported positive sputa in 70 per cent of 60 tuberculous diabetics. Banyai³⁷ found positive sputa in 27 out of 31 sanitarium cases. Grillo⁵⁶ reported positive sputa in 25 out of 30 cases in New Haven. Apparently when diabetic tuberculosis is active and examinations of the sputa are carefully and frequently made, the usual acid-fast forms are found about as frequently as in non-diabetics.

b) *Cultural and metabolic characteristics of the tubercle bacillus in relation to diabetes*. No other pathogenic organism has been so exhaustively studied by chemists as the tubercle bacillus. The distinguishing feature chemically is the wax substance, although protein, carbohydrate and fatty substances with mineral residues are present. The lipins compose 10 to 40 per cent of their dry weight. The important waxy substance has been shown to be a complex alcohol combined with various fatty acids. Lecithin and cholesterol, both of which lipid substances frequently are found in excess in the blood of diabetics, have not been demonstrated in the tubercle bacillus.

The bacilli contain several types of polysaccharide. A gum-like polysaccharide isolated from the body of the bacillus (similar to or identical with one obtainable from the culture filtrate), is a highly potent reacting "antigen" with the serum of tuberculous patients or horses immunized to dead tubercle bacilli. It does not

itself elicit antibody production. This carbohydrate, or derivatives from it, also appears capable of causing severe depressant symptoms on injection into tuberculous animals. Whether a modification of the tubercle bacillus would be found in bacilli isolated from a diabetic is an interesting speculation.

One-half the weight of the tubercle bacillus is protein in nature. Nucleoproteins have been extracted but none were toxic. A nucleic acid was obtained by Ruppel³⁸ and thus "tuberculinic acid" has been the chief center of interest. No true toxin has been isolated from the tubercle bacillus. The febrile and constitutional reactions in active disease are accounted for on the one hand, by deaths of the bacilli and absorption of the compounds liberated from them and on the other hand, by the products of tissue injury. The reactions to tuberculosis in diabetes often exhibit the same unexpected mildness of degree that are seen with acute infections such as appendicitis. The more cachectic the diabetic, the less he seems to react to tuberculosis.

The production of tubercles is the result primarily of local multiplication of tubercle bacilli. The chemical changes in the body fluids, and to a lesser degree in diabetic tissues, are fairly well known. In order to consider their possible effect in providing a specially suitable environment for the organism we may draw upon the review of the nutritional requirements of that organism by Wells. For this purpose knowledge afforded by controlled artificial culture is necessarily the chief reliance.

Its water relations are distinctive. Although it thrives best in a moist atmosphere, it will not grow when covered by a surface film of water, as, for example, below the surface of a liquid culture medium. Dehydration is a marked feature of diabetic acidosis and indeed of uncontrolled diabetes generally. Not only the skin and tongue but internal tissues, such as the eye and trachea, show the effects of great water loss under these circumstances.

This delicate requirement for a proper water relation is believed to be linked with its respiratory peculiarities. The bacillus is strictly aerobic, thrives best in a high concentration of oxygen, and needs a certain minimum of carbon dioxide, although repressed by higher tensions of this gas. It grows at its best close to neutrality, but nearly at its maximum within the wide range of hydrogen-ion concentration, at least from pH 6.4 on the acid side to pH 7.8 on the alkaline. In diabetic coma the pH has been found as low as 7.03.

Its inorganic ion requirements are simple. Apparently potassium, magnesium and phosphate ions are the only absolute essentials, but it is customary to include sodium, chloride and sulphate ions for maximum growth. Sulphur

does not seem to play the part in the oxidizing mechanism of the tubercle bacillus claimed for it in animal cell. Calcium appears quite unnecessary. Iron in minute quantities stimulates, and in larger amount depresses growth.

It obtains its nitrogen from the amino group. Its own proteolytic enzymes are weak, so it does not grow well on whole protein. Ammonium salts, amino acid amides are entirely sufficient, and must be present before much attack can be made on the higher molecular combinations of nitrogen. The protein metabolism is often seriously disturbed in diabetes. Thus during periods of active diabetes, great losses of weight occur with wasting of the muscles. Especially during acidosis and coma, excessive destruction of protein occurs. Occasionally nitrogen excretion of 25 to 30 grams in 24 hours without acidosis occurs, although this is not true of the diabetic under modern control. During acidosis, values of 30 to 35 grams have often been reported according to Joslin. An Italian, described by Joslin, voided at the outset of treatment 7000 cc urine in 24 hours, containing 48.3 grams of nitrogen. This represented the tremendous amount of protein consumed by an untreated case. Such protein is not normally metabolized and stored. Its destruction provides large amounts of nitrogen, amino acid and ammonia. In acidosis the excretion of ammonia in a diabetic may reach 5 to 6 grams in 24 hours. Furthermore, during acidosis and coma a retention of nitrogen occurs due apparently to renal block. The non-protein nitrogen is elevated as a rule and sometimes a value of 90 to 100 milligrams per 100 cc is reached for short periods.

Case No. 2448, aged 17.9 years at onset of diabetes, entered the Deaconess Hospital December 1, 1921. The twenty-four hour urine contained 30.8 grams nitrogen and 2.2 grams of acetone as well as 660 grams sugar. Ten months later acidosis with excessive ammonia formation and total urinary nitrogen were observed. Although insulin and dietary treatment reduced acidosis, hyperglycemia, and lipemia as well as converted the negative nitrogen balance into a positive balance, he did not adhere to instructions and repeated attacks of acidosis occurred. Pulmonary tuberculosis developed at the end of two years with death four years later.

Low values for nitrogen excretion occurred during the period of treatment with severe undernutrition and are also noted when sudden inauguration of insulin treatment and a diet of moderate proportions are used.

Glycerol appears to be the only alcohol capable of acting as a sole source of carbon for the tubercle bacillus. As noted above, Proskauer and Beck³⁹ recorded the inability of other polyhydric alcohols, including glycol, erythritol, dulcitol and mannitol, to replace glycerol. Ethyl alcohol failed to support growth of the true tu-

bercle bacilli, while suitable as sole carbon source for most of the acid-fast saprophytes. Kondo⁴⁰ confirmed most of these findings. Glycerol should be unusually abundant in blood and tissue fluids of the diabetic, but I know of no analyses. The diabetic in the past has had a diet rich in fat. The common edible fats are chiefly the glycerol esters of stearic, palmitic and oleic acids. These are split in the intestine into glycerin and fatty acid and absorbed into the blood stream. Their resynthesis and storage as fat or their oxidation occurs in the tissues. Another factor in providing much glycerol in the diabetic is the great loss of weight and destruction of fat tissue within his body either in the early stages of the disease or during acute phases, such as acidosis. At such times an excess of glycerol should be set free. The excess of fat in the blood was formerly much more frequent than now. Insulin and the modern diet of more nearly normal proportions should prevent such abnormalities. If these purely diabetic alterations of metabolism have a predominant influence, a difference in the incidence of tuberculosis before and since the use of insulin should be apparent. Thus prior to 1914 among 18 fatal cases tuberculosis developed after diabetes had existed for an average of 3.4 years. Between 1922 and 1931 among 96 cases tuberculosis developed after diabetes had existed 4.6 years.

Simple carbohydrates may support moderate growth of the bacillus in the absence of glycerol, and in the presence of glycerol they lead to a definite enhancement of growth. Gamble and Herrick⁴¹, using the Folin blood sugar method on dextrose broth in which tubercle bacilli had been cultivated three months, found a utilization of dextrose by all of five strains of bacilli, including human, bovine and avian types, of from 12 to 80 per cent of the original content. Sugar utilization was roughly parallel to the amount of growth. Froun and Guillaume⁴² found that the utilization of dextrose in glycerol-free sugar media increased with the concentration of sugar. One gram of bacilli used up 2.37 grams of glucose in 0.5 per cent glucose solution and 5.84 grams in 4 per cent solution. Eastwood⁴³ also studied the favorable influence of glucose upon the growth of tubercle bacilli.

Of all sugars tested, glucose has been found by most observers the most suitable. Results with other carbohydrates do not agree.

Bernheim and Dieupart⁴⁴ reported that a study of the employees in a sugar factory showed 150 cases of tuberculosis among 1500 workers. The women were more frequently infected than the men. They regarded mechanical injury of pulmonary tissues by the sharp sugar dust as the important etiologic factor.

The presence and amount of glycogen in tuberculous tissue may be influenced by diabetes and especially by insulin treatment. We know

that glycogen disappears from the skin and liver when diabetes is uncontrolled or during the course of severe infections. Yet a normal amount of glycogen may be maintained in the skin and liver under conditions of good control by means of an adequate diet and insulin dosage.

In general, glycogen is found especially in acute inflammatory conditions where there are numerous leucocytes, although it is also found in the fixed tissue cells. Chronic inflammatory processes usually exhibit very little visible glycogen and this is true of tubercles, according to Wells and Long. Generally little or none is present, yet it has been found in both the leucocytes and epithelioid cells of tubercles, and occasionally even in the giant cells. In guinea-pig tuberculosis it is more abundant, presumably because of the more rapid course, and Gierke found much glycogen visible in the epithelioid cells and in the adjacent connective tissue, which is attributed by Pinner⁴⁵ to phagocytosis of polymorphonuclear leucocytes containing glycogen, and possibly to disintegration of tubercle bacilli, which contains 4.1 per cent of their dry weight of glycogen (Warkany). Lubarsch⁴⁶ states that it is most abundant in experimental tubercles sixteen to twenty days old, disappearing later. Devaux⁴⁷ found glycogen often in the same cells that contained tubercle bacilli. It was never found in the lymphocytes. The largest amounts are in the tissues immediately outside the zone of necrosis, but all cells showing nuclear destruction are free from glycogen. The glycogen is, therefore, found in much the same places as the fat deposits. Very young tubercles, that as yet show no necrosis, are glycogen free, but in acute processes associated with polymorphonuclear infiltration glycogen will be found in these cells.

In general, uncontrolled diabetes is characterized by a disappearance of glycogen from the normal depots in liver, muscles and skin and excessive deposition in abnormal sites such as tubular epithelium of the kidneys and the nuclei of liver cells. Insulin causes a return of glycogen to the normal loci and disappearance from the abnormal sites. Possibly the glycogen of tuberculous tissue is somewhat similarly affected.

The nitrogenous needs are in all probability always easily met. In the diabetic at all times there is a considerable amount of amino nitrogen available either about to be synthesized into body structure, or in the course of wear and tear liberation from actively metabolizing tissues. In acute phases and especially in acidosis the tissues must be flooded with nitrogenous compounds easily available for the nutrition of the bacilli. It is not difficult to imagine a frequent oversupply of these life-sustaining substances for the growth of the bacillus.

The carbon requirement is not a simple problem. Glycerol and glucose are both present in

the body, but chiefly in the combined state as fat or polysaccharide respectively, both non-utilizable by the bacillus. A certain amount and at certain periods an abnormally large amount of each, however, is free and readily available. It is difficult to determine how much glycerol is present, Long has made rough approximations, and feels that in the blood of non-diabetics at least, it never reaches 0.5 per cent, which is the minimum amount compatible with existence in vitro. The usual amount added in culture media is 5 per cent. As a matter of fact, 8 or 10 per cent affords more luxuriant growth. Long⁴⁸ is inclined to believe that the patient's disordered fat metabolism, through an increased available amount of glycerol, may be of more significance than hyperglycemia. The same is a possibility in the confirmed alcoholic, also of notorious susceptibility to tuberculosis, in whom the alcohol is metabolized in place of a normal diet.

c) *Virulence* By virulence is meant the power of the tubercle bacilli to produce progressive tuberculous disease. Human types of low virulence have been isolated, particularly from cases of lupus. It might be supposed that the apparent severity and rapid progress of diabetic tuberculosis were due to chance infection of this relatively small group as compared with tuberculous patients as a whole, by organisms of uniformly high virulence, whereas in the larger group many cases were infected with organisms of attenuated virulence. No evidence whatever may be adduced in support of the hypothesis. In fact it seems unreasonable in view of the fact that in so large a percentage of diabetic cases, definite familial exposure is known and therefore presumably the same organism infected both diabetic and non-diabetic members of the family.

Long⁴⁸ points out that virulence may be related to the initial capacity of the organisms to grow in cells. He cites the experiments of Maximow who noted that tubercle bacilli tended to die out after growing in cells while non-pathogenic acid-fast bacilli did not. Perhaps the phagocytes of Metchnikoff and the later "macrophages" are really cells providing good condition for growth. Again we are led back to the thought that it is the cells of the diabetic which in some way provide advantageous cultural conditions for the tubercle bacilli.

2) *IMMUNITY OF THE DIABETIC* Growth of the bacilli in human tissues clearly depends upon chemical factors such as availability of substances for nutrition, the reaction and oxygen tension of environment, water relations, temperature, etc. Many other conditions, as yet hardly studied, may apply. In addition to a favorable effect upon growth, the diabetic environment might bring about a relative increase in virulence by favoring a dissociation of organism (according to the work of Petroff and as-

sociates) leading to the predominance of a virulent form. Long believes that the explanation of native immunity lies in these factors.

Native immunity must vary greatly in different individuals. The variation in size and extent of old healed lesions of tuberculosis at autopsy is difficult to explain on the basis of accidents in the virulence and dosage of original infection. The native immunity of diabetes as a group is not low if one considers the following facts:

- a) Deaths from tuberculosis in diabetic children are rare. (See Chap. III, *New Eng. J. Med.* 210 [Jan 18] 1934.)
- b) The ages at death of tuberculous diabetics are not less than among non-diabetics.
- c) The evidence of healing shown by calcified glands in 1659 diabetics routinely x-rayed shows that 77 per cent have been infected and have partially healed.

It is obvious that native immunity does not prevent the growth of bacilli in the tissues. Even though the first infection is healed, controlled or arrested for many years, re-infection from without or a change in the host which causes a re-lighting of an old focus leads to tuberculous disease. A new factor is now present. Necrosis of tissue is a characteristic feature, largely due to the hypersensitive (or allergic) state of the tissues to products of the bacillus which were formerly relatively harmless. At autopsy tuberculous patients are practically never seen in whom the pathologic changes have been uninfluenced by hypersensitiveness. On the contrary, it is the hypersensitive state which makes the tuberculosis fulminant. Indeed most caseation and necrosis occur because of hypersensitivity. Although some immunity is acquired from primary and even repeated infections, it is not persistent or effective in the face of massive re-infection and its chief effect is to alter the character of the resulting process by tending to prevent widely disseminated lesions. Does diabetes affect the immunity conferred by infection? Does it affect the degree of hypersensitiveness? We have seen that the tissues of the diabetic may well provide a medium richer in such nutrients as glycerol, amino acid nitrogen and glucose and so encourage multiplication of bacilli. Pathologically chronic processes of caseation and extensive cavitation largely localized in the lungs are most commonly the cause of death indicating definitely sensitized tissues with sufficient immunity to avoid frequent generalized processes. Clinically the symptomless character of many cases has been greatly stressed which would suggest a lesser degree of hypersensitiveness than in non-diabetic tuberculosis. However, this point has been grossly exaggerated and will be discussed later.

An insidious onset with frequent "colds" is common in non-diabetics. Early diagnosis of tuberculosis in diabetics has been rare in the past, probably because too often the attention has been centered on diabetic treatment. If one could be convinced that improvement in diabetes was regularly correlated with improvement and healing in the tuberculosis, it would clearly indicate the importance of certain metabolic changes in the host. Tuberculosis sometimes develops even when diabetes is well controlled and contact with active cases excluded. Case No. 1977, aged 80 years, although confined to her room in a hospital and under constant diabetic treatment for two years, died of pulmonary tuberculosis and tuberculous peritonitis. She had no fever, no cough, and no physical signs were recognized until her terminal illness which was regarded as pneumonia. It must be admitted that whenever improvement has occurred in our experience, not only good diabetic treatment but good treatment of the tuberculosis has been necessary. However, most observers have agreed that control of the diabetes does have a definitely favorable effect. The converse is clearly shown by the incidence of tuberculosis in patients who have had coma. Recently two girls, ages 19 and 24 years, after making unusually good progress in a sanatorium, broke down a year later when diabetic treatment was neglected. This again supports the idea that improvement and healing in diabetic tuberculosis are due not only to rest, and removal from an environment favoring re-infection, but also in considerable degree to a better metabolism of the host, probably affecting intracellular nutritive conditions of the bacilli.

3) ALLERGY AND RESISTANCE. All students have agreed that primary infection confers some immunity against re-infection but this immunity is temporary and fleeting. Zinsser¹⁰ considers that it acts rather to modify the effects of re-infection than to prevent added bacilli from having any effect. It sets up a reaction between body and organism tending to chronic and limited tuberculous formations rather than to disseminated and progressive foci. Therefore, in studying diabetics it is of primary importance to determine whether tuberculosis tends to such chronic and limited types if we seek to understand the effect of diabetes upon the development of immunity.

The persistence and completeness of immunity depend entirely upon the size of the re-infecting dose and the virulence of the organism. In the children of tuberculous parents, repeated and almost constant new infections may occur. The effects will vary in different persons according to the dosage, the virulence of the organisms and the immunity or resistance of the individuals. Furthermore, the resistance

or immunity of the individual may vary from time to time in relation to his general health, the development of complications, etc. In tuberculosis the reticulo-endothelial cells seem to play more than one defensive rôle. As phagocytes they are of chief importance; most of the tubercle bacilli, after a brief sojourn in the polymorphonuclear leucocytes, being found inside reticulo-endothelial cells. Next, they are the chief cells that form the encapsulating tissue to limit the spread of the infection, and also, it is to be presumed that they act as prime factors in the immunological defense against the tubercle bacilli as they seem to be against other pathogenic bacteria. In addition to this they seem to play a formerly unsuspected rôle in chemotherapy, for it has been found that if the amount of available reticulo-endothelium is reduced by splenectomy or by blockade, the efficiency of chemotherapeutic agents is correspondingly reduced. This may possibly be because the chemotherapeutic agent acts mainly by stimulating the reticulo-endothelial cells, or because these cells transform the drug into a more potent form. It is to be noted that most of the chemotherapeutic agents that have seemed to accomplish some increased resistance to tuberculosis, have been substances that are taken up by the reticulo-endothelium. In diabetes these cells are sometimes found to be distended with fat, especially under conditions when the diabetes is relatively uncontrolled. In cases reported by Warren and Root⁵⁰ lipid material was deposited chiefly in the reticulum cells of the spleen, the Kupffer cells of the liver and endothelial cells of lymph nodes. However, none of these cases died of tuberculosis. When the fat of the blood is increased in coma, the function of these cells is reduced and resistance to tuberculosis diminished. Experimentally, interference with this system according to Gay⁵¹ may facilitate infection in the normal animal, if the system has been thrown out of function; or, on the other hand, infection is prevented if the macrophages are stimulated to greater activity.

That diabetes probably does not increase the degree of sensitivity, but rather diminishes the allergic state is suggested by the rarity of acute exudative lesions in the serous membranes and especially the joints of diabetics. Indeed, Labbé believed that in diabetic acidosis, allergy was in abeyance and that then the resistance to reinfection associated with the allergic state similarly was lowered. Beckman⁵² also suggests that acidosis may suppress the usual allergic response to reinfection and thus explains the relatively slight symptoms produced by tuberculosis in the diabetic. Certainly it appears true that diabetic coma and uncontrolled diabetes have been frequently followed by a flare-up of tuberculosis in our cases.

The chronicity of some cases of pulmonary tu-

berculosis even in young diabetics is surprising. Case No. 2274, boy, lived with his tuberculous grandfather till his death when the boy was six years old. He developed diabetes at the age of six years and tuberculosis was recognized at the age of 11 years. At the age of 16 years both lungs are extensively involved (see Chap. III, *New Eng J Med* 210 [Jan 18] 1934) but he has grown normally and weighed 93 pounds in December, 1932. Case No. 10163, female, developed pulmonary tuberculosis at the age of 14 years and spent four years in a State Hospital. Sputum was positive. She developed diabetes at 28 years. In July, 1932, at the age of 35 years, she was able to do her housework, weight 119 pounds. Pulmonary involvement is extensive (See Chap. IV, *New Eng J Med* 210 [Jan 25] 1934 for roentgenograms).

4) CONTAGION OF TUBERCULOSIS. Among the 245 cases of this series definite infections within the family in contact with the patient are recorded in 65. In 40 others, family infection is possible but not definite, in that no reliable data are available as to the presence of a positive sputum, the frequency or duration of contact. In the children exposure to tuberculosis occurred in the family or at work as in Case No. 5932, who worked in a grocery store where another employee was found to have a positive sputum. Such exposure was found in all but four cases for whom we have been unable to get the data. Fitz³ reported 11 cases (31 per cent) with tuberculosis in the family and two cases (6 per cent) with both diabetes and tuberculosis in the family.

The hereditary tendency to diabetes is definite. Is there hereditary infection with tuberculosis? Recently Calmette⁵³ has reported the cultivation of a tuberculous ultravirus obtained from the lymph glands of infants born of tuberculous mothers and dying of an intoxication within a short period after birth. Deaths from tuberculosis in diabetic children are almost unknown. The incidence of known maternal tuberculosis in diabetic cases is too small to support this interpretation of the mode of infection.

Next to familial contact in importance is the prevalence of tuberculosis in the community. Variations from decade to decade are considerable. Differences between European and American communities, and between rural and urban communities are also great. Zachs⁵⁴ reported that in the families of the 110 children with adult tuberculosis, tuberculosis was known to exist in 69 or 64.4 per cent. In our twelve diabetic children, family exposure is known in seven or 58 per cent. Although the number is small, the comparison suggests that contact with active cases rather than the influence of diabetes should be stressed. Not only the family but the danger of unpasteurized milk fortunately now

much diminished, the occasional case of open tuberculosis in school teachers emphasized by Klein and rare carriers of bacilli without evident lesions such as the cases described by Floyd and Novack must not be forgotten in trying to trace the infection in diabetic children

SUMMARY

1) One hundred and twenty-six autopsies upon tuberculous diabetics are summarized

2) The tuberculous diabetic need not proceed rapidly to death from tuberculosis. At autopsy healed and healing lesions are frequent

3) Primary foci occur in childhood and areas of calcification in the parenchyma were observed in 76 out of 87 chest films of adult tuberculous cases

4) Miliary, meningitic and acute generalized tuberculosis are rare

5) Caseation and cavitation involve chiefly the upper lobes although the first lesions of re-infection were sometimes observed at or below the level of the hilum

6) Acute pneumonic or miliary processes were found usually as terminal events in a chronic pulmonary process

7) The presence of large caseating lymphatic glands together with pulmonary tuberculosis in five cases resembled the tuberculosis of Negroes

8) Because of primary infection early in life, diabetics are highly sensitized. Their resistance seems to have been normal until diabetes developed

9) Etiologic factors introduced by diabetes are concerned chiefly with changes in body chemistry which may favor multiplication of bacilli or development of variants. These include disordered protein and fat metabolism with increased amino acid nitrogen and glycerol in the tissues, induced especially in periods of acidosis

10) Contact with open cases is known in a sufficient number to make evaluation of other factors difficult

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ARTERIOSCLEROSIS IN THE ARTHRITIC*

BY H ARCHIBALD NISSEN, M D,† AND K A SPENCER†

THE presence of arteriosclerotic changes in arthritis has been very noticeable during the work done in the Survey of Chronic Disease at the Robert B Brigham Hospital. The frequency

of vascular changes in the radiology reports directed attention to the probable value of a study of such changes. All of the radiograms taken on 251 arthritides were examined from the point of view of blood vessel changes†. Where there was definite sclerosis it was noted as a positive observation in that patient, irrespective of its location. Some showed sclerosis only in the pelvic vessels, some only in the extremities

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†Nissen—Spencer—For records and addresses of authors see
*This Week's Issue page 109

†This was made possible by the helpful cooperation of Dr Sydney L Morrison Roentgenologist.

(The location of sclerosis has not been emphasized in this paper because its etiology is unknown) Although in a number of the radiograms sclerosis of veins as well as arteries was obvious, we have dealt only with arterial changes. The changes noted in the arteries were consid-

more technical problems suggested by the clinical findings may eventually solve the riddle where individualistic activity has heretofore failed

The 251 patients studied were divided as follows

Sex		Age		Duration		Type Arthritis	
Male	(108) 43%	1 20 yr	(22) 9%	Months	(46) 18%	Type 1	(90) 35%
Female	(143) 57%	21 30 "	(42) 17%	1 yr	(26) 11%	Type 2	(72) 29%
		31-40 "	(59) 23%	2 yrs	(24) 11%	Mixed Type	(37) 15%
		41 50 "	(51) 20%	3 "	(18) 8%	Struempell Marie	(18) 7%
		51 60 "	(50) 20%	4 "	(11) 4%	Rheumatic Fever	
		61 70 "		5 "	(23) 9%	Syndrome	(9) 4%
		and over (27)	11%	6-10 yrs	(57) 22%	Still's	(15) 6%
				11 20 "	(38) 15%	G C	(8) 3%
				Over 20 yrs	(8) 3%	T B	(2) 1%
<hr/>							
Definite Tissue Alteration (103) 40%				Elevated Blood Pressure (26) 14%			
Weight loss (81) 31%				Fever (83) 33%			
Weight gain (22) 9%							
<hr/>							
Urinary Abnormality				Activity of Arthritis (97) 39%			
Sugar (26) 10%				" Activity Arthritis (37) 15%			
Nephropathies (65) 26%							
				(134) 54%			
<hr/>				<hr/>			
Foci Infection				Clinical Heart Abnormality (62) 25%			
Tonsils (133) 54%							
Teeth (45) 18%							
Antra (14) 6%							
G I tract (14) 6%							
<hr/>							
Blood Vessel Changes by Radiographic Examination							
Negative Vessels (no vessels seen)				(51) 20%			
Barely Visible Vessels				(59) 25%			
Questionable (probable) sclerosis				(34) 14%			
Definite sclerosis				(89) 36%			
Marked sclerosis				(18) 7%			

icap Twenty of the 48 showed multiple and marked crippling and deformity. It is interesting to speculate on what the future years hold in store for the first two groups, that is the ambulatory with slight joint handicap and the ones with no handicap, but who do show sclerosis. Will they join the 20 who already show marked impairment of functional activity, or will they not? It raises the question. Does early sclerotic change have prognostic value for the arthritic?

SERIAL RADIOGRAPHIC STUDY

Serial radiograms were available in many instances, and it was possible to trace the changes in blood vessels in 41 patients from negative in the beginning to sclerosis. This certainly emphasizes the value in patients with chronic disease of regular serial radiographic studies of parts of the body other than those which are the outstanding chief complaint. If every aid is used to obtain various body measurements year after year (lack of funds is usually the reason that this policy is not generally pursued) sufficient scientific data should be accumulated from the group so followed that more rapid progress toward the solution of certain phases of chronic disease may result. This serial radiographic study raises the question as to whether it is normal to visualize blood vessels by radiogram, or is such visualization a forerunner of sclerosis, and has it diagnostic value? It is a known fact that postmortem examinations show diffuse or isolated areas of arteriosclerosis. It is also a fact that the development of sclerosis is much more rapid in some people than in others. It is not a deterrent to functional activity in some, while in others apparently it is the chief cause of mental or physical disability. The unusual point brought out here is the age of the patient at the time of the appearance of sclerosis and the observation of its progressive development. During the years in which sclerosis appeared in these patients followed by serial radiograms, in the younger group the proportion of those who were physically active and those inactive is roughly equal. In the older group, 80 per cent were active physically, 20 per cent inactive. The following is a chart representing the ages of patients during which the vascular changes occurred. It is interesting to note that a number of these patients had a low sugar tolerance*. However our study has not proved any consistent definite association between arteriosclerotic changes and low sugar tolerance.

No constant standard technique was used in the radiograms studied in this paper. When radiographic technique is standardized the question of visibility of blood vessels being normal or abnormal may be answered. Such standardization is therefore important, particularly for

SERIAL RADIOGRAMS OF SOME OF THE ARTHRITICS STUDIED

Patient	Vessel Change					Type Arthritis	Age
	Negative	Visible	Questionable	Definite	Marked		
Male	X			X		Mixed	32
Male	X					Struempell Marie	25 33
Male	X		X			Struempell Marie	19 20
Male		X		X		Rheum Fever Syndrome	16 18
Male	X			X		Rheum Fever Syndrome	27 29
Male			X	X		G C Arthritis	27 30
Male			X	X		Rheum Fever Syndrome	28 35
Male		X		X		G C	32 33
Male		X		X		T B Arthritis	27 30
Male	X			X		Type 1	33 35
Male		X		X	X	Type 1	22 27 28
Male		X		X		Type 1	34 38
Female			X	X		G C	23 26
Female		X		X		Type 1	24 28
Female		X	X			Type 1	24 27
Female		X	X			Type 1	19 21 25
Female		X	X	X		Type 1	39 49 50
Male			X	X	X	Type 1	38 42 44

a serial study of sclerotic changes. At the present time, there is no question as to recognition of definite or marked sclerosis, but the earliest detectable form is still debatable.

INCIDENCE OF SCLEROSIS

There was a slightly higher percentage of sclerosis in males than in females. In Type 1 (90) 38 per cent showed probable, or definite, sclerosis. The appearance of sclerosis was noted in 27 per cent of the 90 when they were under 40 years of age. Type 2, and the Mixed Type, had the highest percentage of sclerotics as one would expect. Of the 72 patients in Type 2, 78 per cent showed sclerosis, and 7 per cent were under forty. In the Mixed group, 73 per

*Sugar Tolerance in the Arthritic. Nissen and Spencer
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cent of the 37 patients showed sclerosis, and 8 per cent were under 40 years of age. In the 18 Struempell-Marie arthritics, 44 per cent showed sclerosis and 39 per cent of these 18 were under forty. Nine patients were listed as Rheumatic Fever Syndrome, 45 per cent of whom showed sclerosis, and these were all under forty. The 8 gonorrheal arthritics all showed sclerosis, and 88 per cent were under forty. It is unavoidable to be interested in any startling observation, and the fact that this entire group, though a small one, showed sclerosis deserves more study.

TISSUE ALTERATION

Another striking observation which has become more noticeable as the study of arthritis has progressed is the marked variation in tissues, such as weight loss, weight gain, muscle atrophy, obesity, and intermittent gains or losses in weight. This change in the homeostasis of tissue balance appears to be of definite significance, and is also being studied and analyzed in more detail for future publication. It is noted in this paper as marked loss or marked gain in weight at the time the radiograms were taken. To repeat, 81 of the 251 patients studied showed marked loss of weight and 22 marked gain. Males and females showed equal percentage of weight loss, but the females outnumber the males in weight gain six times. The blood vessel changes in the group showing weight loss were as follows:

Negative Vessels (no vessels seen)	(17)	21%
Barely Visible Vessels	(23)	28%
Probable Sclerosis	(11)	14%
Definite Sclerosis	(27)	33%
Marked Sclerosis	(3)	4%

Comparing this table with the similar table of the entire group of arthritics irrespective of anything but vessel change, it is extremely interesting to note that the percentages are almost identical.

Of the 22 showing marked gain in weight, six had visible blood vessels and 16 definite sclerosis. Therefore, with 50 per cent of the group with loss of weight and 72 per cent of those with gain in weight showing probable or definite sclerosis, it seems suggestive that there is a connection between the mechanism regulating tissue change and vascular change. Is it not probable that variability of tissue (weight gain, loss or constant variation) is of greater importance than heretofore has been considered? Because this is certainly a disturbance of the normal tissue balance of the body. In the group showing gain in weight, 6 showed nephropathies, none sugar, in the urine, 13 had tonsils. Of the group with loss of weight, 24 showed nephropathies, 10 sugar, and 34 had tonsils.

BLOOD PRESSURE

The frequency of elevated blood pressure in arteriosclerosis in the group studied was not constant or marked. Only 36 out of the 251 patients showed high pressure. Five of these showed negative or visible blood vessels, 31 showed probable or definite sclerosis, 17 of the 31 were in the group of early sclerotics under forty. The relationship between elevated blood pressure and arteriosclerosis is not unexpected, because the work already done on essential hypertension without demonstrable proof of sclerosis is well known, as is the presence of marked sclerotic changes in blood vessels without elevation of blood pressure. Since one may find plus or minus blood pressure readings with or without sclerosis in non-arthritics, it is not astonishing that one finds comparable measurements in arthritics.

URINARY ABNORMALITIES

Of the 65 showing nephropathies, 27 had negative or visible vessels, 38 were in the sclerotic group. Seventeen of the 38 were in the group with sclerosis under forty. The incidence of sugar was negligible.

SEVEN FOOT RADIOGRAMS OF THE HEART

Seven foot radiograms of the heart were taken on 61 patients. Fifty-three or 85 per cent showed definite changes in the heart and 37 or 61 per cent showed definite changes in the blood vessels. The cardiac changes consisted of general enlargement of the heart, either of the rheumatic or sclerotic type, and left ventricle rounding. Eighteen or 30 per cent showed denseness, thickening, tortuosity or actual calcium plaques in the arch. The patients' ages ranged from the first to the eighth decade. Thirty-five of the group were under 50, 26 over 50. Though 53 patients showed heart abnormalities by radiogram, only 16 are listed as "Clinical Hearts." Twelve of the 48 patients with sclerosis of the vessels appearing under the age of forty had seven foot radiograms of the heart taken. Two of the 12 showed hypertrophy and sclerotic hearts, 4 showed hypertrophy and rheumatic hearts, 2 showed definite changes in the arch, and only 4 were considered normal hearts. An interesting fact is that in a certain number of these patients the changes in blood vessels and heart antedated the appearance of the symptomatic joint involvement, as the vascular changes were demonstrable by radiogram at a time when the duration of the arthritis was noted as a matter of only months. Again it is well to emphasize as this series indicates that the actual duration of arthritis in itself is not a deciding factor as to the prognosis of the case. Actually, of the 141 patients showing probable and definite sclerosis, 30 gave a his-

tory of duration of arthritis from 6-10 years, 26 a duration of months, with the remainder showing small percentages in the other year-duration groups. Of the 48 early sclerotics, 15 had arthritis of 11-15 years' duration, 15 a duration of months, and 11 with duration of 6-10 years.

FEVER AND ACTIVITY OF ARTHRITIS

Apparently the incidence of sclerosis had little relationship to fever or activity of the arthritis. In fact of those with fever and activity of disease a few more were in the groups with negative or merely visible blood vessels than were in the sclerotic groups.

FOCI OF INFECTION

Tonsils predominated as probable foci of infection. The majority of the 133 with retained tonsils were in the older group of patients. The presence of tonsils may be a source of toxin irritation with intermittent absorption, and in older people particularly may well play a part in the gradual progression of arthritic changes, or even in their production. The purpose of this paper is not to go into detail regarding foci of infection. It is by no means our contention that the mere presence of tonsils, which may or may not have the appearance of chronic inflammatory remissions and relapses, is sufficient, irrespective of age and the patient's physical condition, to indicate their immediate removal in hope of producing a miraculous alleviation of the arthritic syndrome.

Thirteen of the group with tonsils were in the sclerotic group under forty, while 67 were in the group with probable and definite sclerosis over forty. Thus of course indicates that tonsils are more uniformly removed in childhood in the present day than a decade or so ago. The technique of tonsillectomy has also been perfected, lessening the chance of retention of tonsillar remnants.

CONCLUSION

If one studies the material presented in this paper, one is likely to consider the prognostic significance of definite arteriosclerosis in an arthritic group irrespective of type, whose age is under forty. This is an enticing idea, because a large percentage actually did show progressive vascular changes irrespective of the arthritic type. Does this by any chance indicate a disordered mechanism, which in turn is responsible for the joint changes? Or does the variety of the arthritic types represented emphasize again that it is the individual rather than the type that makes for degeneration or change in tissue function in the arthritic? Is the tendency to produce sclerosis merely another manifestation of a catalytic "X" which may be the pro-

ducer of the arthritic syndrome and may act before the joint subjectively is involved? The proportion of sclerotics under forty years of age in this group of arthritics is much larger than one anticipates or actually finds in comparable groups who have no arthritic manifestations. Are the changes in the vascular system merely another link in the chain comprising the various systemic changes present in arthritis? May the vascular changes prove to be another lead working toward a common etiological centre, which may have to do with the production of arthritis? These questions deserve intelligent consideration.

SUMMARY

1. Reiteration is frequently brevity in its most subtle form. Therefore, once again we note that our study of arthritis is primarily clinical.
2. Two hundred and fifty-one arthritics form the material upon which this paper is based. One hundred and twenty-three were under forty years of age. Forty-eight or 38 per cent of these showed probable, definite or marked sclerosis. The fact that sclerosis was present at such youthful age in a group of this size is significant and worthy of further investigation. Yearly serial x-ray studies of arthritics seem to be indicated in order to note progressive vessel changes as well as changes in heart, gastro-intestinal tract, bone or joints. Otherwise it will be impossible to agree upon what is a normal blood vessel roentgenologically. Unless there is agreement there is little chance of detecting early vascular change indicative of later sclerosis or of discovering treatment directed toward the prevention or arrest of the sclerosing process.
3. The relationship between arteriosclerosis and elevated blood pressure, urinary or clinical heart abnormalities was not remarkable. Fifty-four per cent of the group showed definite or questionable activity of the arthritic syndrome.
4. Possible foci of infection in teeth, ears, antra, gastro-intestinal tract, genito-urinary tract and respiratory tract were present in varying, but not marked, percentages. The presence of tonsils or tonsillar remnants was a more prominent source of probable infection, 54 per cent of the patients showing retained tonsils. Tonsils played a small part, however, in the younger group of sclerotics, only 13 in a group of 48 sclerotics under forty possessed tonsils. On the other hand, 67 of the 93 sclerotics over forty kept their tonsils.
5. Known duration of arthritis seemed to have no definite bearing on the incidence of sclerosis. In some instances changes in the vascular system evidently antedated the onset

of arthritis symptomatically. In others, the arthritis had been present for years before any demonstrable change occurred in the vessels

- 6 Seven foot plates of the heart had been taken of 61 of the 251 patients studied. Eighty-seven per cent of these showed definite changes in the heart and aorta. Sixty-one per cent of the group showed blood vessel change and cardiac change. Only sixteen of the fifty-three with radiographic changes in the heart presented recognized clinical signs of cardiac damage

- 7 Definite change in the homeostasis of body tissue is again noted in the arthritic. One hundred and one, or forty per cent of the group showed such imbalance. Seventy-nine, or thirty-one per cent showed marked loss of weight, twenty-two, or nine per cent, marked gain. The importance of the involvement of multiple body systems in the arthritic is stressed once more, and the problem stated again is this: Is arthritis the cause of, the result of, or merely coincidental with, the changes in the functions of the different body systems?

MEDICAL PROGRESS

PROGRESS IN THE DIAGNOSIS AND TREATMENT OF SYPHILIS, 1931-1932

BY AUSTIN W. CHEEVER, M.D.*

DURING the period covered by this report there has been no spectacular accomplishment, but interest in the problem of syphilis is still intensive as is indicated by the reports of clinicians, research workers, and technicians, who are striving for better control of syphilis by increasing its curability with more effective methods and drugs, and by educating the public and members of the medical profession with the hope of lowering its prevalence.

Cole¹ believes that there would be a tremendous decline in syphilis in the next twenty-five to thirty years if all physicians could be impressed with the necessity of early diagnosis, of thorough treatment, and of prophylaxis, if the latter could be made to realize the consequences of this disease, and if all applicants for marriage could be compelled to undergo a physical examination. In a discussion of the present extent of syphilis Cole refers to a questionnaire sent out in 1926 by Jadassohn to fifty-one specialists in nineteen countries. The answers show a unanimity of opinion that the disease was declining in fourteen of these countries at that time, attributable to the use of arsphenamine. However, Fuss, who has recently reviewed the matter of incidence in Europe, is quoted¹ as being of the opinion that the disease is increasing again, due either to a periodic fluctuation or to greater promiscuity in connection with unemployment, immigration, and other causes.

In Indo China² the venereal diseases take a place second only to malaria in importance, but there is almost a complete absence of syphilis in New Caledonia and New Hebrides and a similar absence in Fiji, Solomon Islands, and New Guinea. At the Dermatosyphilologic

Clinic at Florence³ it has been found that venereal disease has decreased in the last five-year period over the previous three periods: total syphilis having decreased almost one-half, secondary syphilis having dropped to little more than one-third with a still greater decrease in venereal ulcer and gonorrhea. During the second half of this five-year period, however, there has been a marked increase so that as the period closes the figures are gaining.

At the St. Louis Hospital, Paris, in 1931⁴ there was a decrease in the number of cases and this was attributed to the economic crisis. In the last few months of 1931 when unemployment was at its worst, there were fewer cases of syphilis and soft chancre. At this time the houses of prostitution reported that their clientele had decreased thirty to fifty per cent.

In our own country the report of the Surgeon General of the Army⁵ showed in 1930 the lowest admission rate for venereal diseases in the history of the service. These diseases at that time caused about eight per cent of all admissions to hospitals and quarters, and two per cent of the deaths. In the Navy⁶ the admission rate in 1930 showed an increase over 1929, but this can probably be accounted for by the visits of the ships to ports in the West Indies. An increase of reported cases in 1931 over 1930 in Massachusetts⁷ has been shown.

Granger⁸ goes so far as to say that "not a man or woman lives who does not elbow an infected individual every day. It is increasing and its present stronghold is among the Negro race." Syphilis is more common among the colored population than among the white, and the Negroes do not realize its ravages. When there are no manifest symptoms or signs they are extremely lax with their treatment. He

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feels that it is a very serious obstacle, the most important single one, in the Negro health problem, and he pleads for more careful investigation and treatment among the colored

Recognition of these diseases as community health problems of major importance has been slow since the war-time fervor, but now in New York State⁹ each county and city board of health is required by law to provide adequately for diagnosis, care, and treatment of persons with venereal diseases who are unable to pay for such attention. Discussion and consultative advice on the medical and public health aspects of syphilis have been made available to physicians and to county medical societies by representatives of the division of social hygiene and the state medical society of New York. They have also made arrangements for sending fluid from chancres to the laboratory for darkfield tests. The state is offering to detail nurses to physicians for investigating sources of infection and for the follow-up of lapsed cases. Free arsenicals are supplied to clinics and to those physicians treating for a nominal fee. The State of Massachusetts¹⁰, also, has been cooperating with the physicians to the extent of supplying free arsenicals, printed information, and consultative service.

Health officers will take courage after hearing of two court decisions reported by Rail¹¹ of the Indiana State Board of Health. A woman who discontinued treatment without permission was finally located and placed in quarantine in the county jail. Action was brought to determine whether health authorities had the right to quarantine infectious venereal patients and whether the county jail was a suitable place. The court ruled that the patient was a menace to the public and should be confined, and since there was no more suitable place, the jail was proper. In another instance, the health officer quarantined a man because he refused to name the person from whom he contracted his disease. The judge ruled that the officer was within his rights in detaining the patient until the information was given. The man finally gave the woman's name and she was examined and found infected.

There have been some interesting legislative trends. A bill has been introduced into the French Senate¹² providing that the civil magistrate shall demand from all persons presenting themselves for marriage a physician's certificate specifying that the person has been examined within thirty days. Doubtless this bill will be more easily passed because it does not specifically mention the venereal diseases and provides that the results of the examination may not be revealed by the physician. Perhaps the failure of five of our states¹³ to pass during 1931 measures requiring examination for venereal diseases before marriage was due to the unfor-

tunate inclusion of the term "venereal diseases" which defeated its own end. The French bill provides only that the examination be made "with a view to entering on the marital relation." Some such bill has been sought in the Netherlands¹⁴, but, though the Council of Health recognizes the value of such prenuptial examination, it doubts if the intervention of public authorities would be advisable.

The Medical and Surgical Director of the Baltimore and Ohio Railroad¹⁵ realizes the danger to the public and to the property of the road in having men in their employ who may be syphilitic, and he checks very carefully for the existence of syphilis, especially neurosyphilis, among those in their service. Persons in a communicable stage are withdrawn, temporarily, from all classes of service, those with neurosyphilis are required to take treatment under the company's supervision and are not returned to engine or train service until there is assurance that the results of treatment are satisfactory. Locomotive engineers with neurosyphilis are permanently disqualified for road service. This is in line with the opinion advanced by Dr. Bla Joo¹⁶ who believes that general paralysis, even in the state of complete remission following pyrexial treatment, may display greater or less defects and should not be treated by law as if they were normal beings. From the point of view of criminal tendencies, patients even with the most complete remissions have to be regarded as unaccountable, he thinks, for their acts and they should not be held legally responsible, but should be isolated and placed under observation, instead of arrest, should they come into conflict with the law.

The education of the laity and medical profession must continue if there is to be a permanent decline in syphilis. Physicians must learn to be suspicious not only of genital "ulcers", but of sores located anywhere because extragenital chancres are not uncommon. Cheever and Wheeler¹⁷ record over one hundred mistakes in diagnosis and treatment of syphilis of those who have come to their attention within three years. As physicians become more "syphilis-conscious", we find in the literature more references to extragenital primaries. Nudenberg¹⁸, writing in the *Semana médica*, Buenos Aires, describes five such chancres located in the suprahyoid region, on the index finger, on the upper third of the leg, in the pubic region, and on the chin.

Nelson of the Massachusetts State Health Department¹⁹ shows the inconsistency of the attitude of most of the hospitals in this State in refusing to accept patients with a diagnosis of syphilis or gonorrhea while hesitating not at all to admit women with "pus tubes" or men with prostatic abscess. Such institutions will admit to their maternity service a woman who is about

to give birth to a baby with syphilis in a highly communicable form. It is apparently a part of a prudish tradition. Nelson thinks, that these diseases were the result of "sin" and as such the victims were unworthy of consideration.

More attention is being given to prophylaxis. It is interesting to note that in Berlin²⁰ there are between 1,500 and 2,000 automats for the sale of prophylactics. In the United States Navy⁶ a test of the efficiency of official prophylaxis was made. On one of the ships there were 251 exposures reported and 251 prophylactic treatments given, 187 of them within an hour after exposure, the longest interval being 10½ hours. After three months' observation the results noted were no syphilis, five cases of chancreoid (prophylaxis was given from less than fifteen minutes after exposure to sixty minutes), gonorrheal urethritis two (one treatment was given five hours after exposure and the second five and one-half). The venereal rate of American troops in China²¹ reached a high mark in 1930 of 566 per thousand. An intensive campaign was started which has brought about a remarkable decrease. In addition to the regular preventive treatment, each soldier was provided with a prophylactic packet and ordered to wear a condom. Inspection was held every forty-eight hours and all scratches and abrasions were treated with mercurochrome which was considered responsible for the decrease in chancreoid infections, but, of course, was valueless for syphilis and gonorrhea. Hull²² in discussing the prophylactic measures provided for the men in the British navy says that he believes the sheath is the best preventive known and should be issued to the men. The navy also provides the men with packets and treatment in ablution rooms with potassium permanganate and calomel cream, and if the men could be persuaded to make a more liberal use of these provisions, the author thinks there would be less disease. He considers that the antiseptic which gives the most promise of protection is samori, a disinfectant which gives off nascent carbonic acid in the form of a foam combined with oxy-chinol sulphate. The German merchant marine²³ has been waging a campaign against these diseases. They have issued for distribution to seamen with venereal diseases pamphlets containing treatment record sheets and information appropriate for use on vessels with and without ships' doctors.

As a preventive of congenital syphilis many measures, some of them drastic, have been suggested. Compulsory declaration of pregnancy²⁴ with penalties for failure to report has been proposed. The difficulties in the way of enforcement are obvious. When one considers that the records of the maternity department of Guy's Hospital²⁵ show that treatment with arsphenam-

ine during pregnancy only, resulted in an increase of about 20 per cent in live births and a decrease of ten per cent in stillbirths it would seem that the advantages of prenatal investigation and treatment would be self-evident, but there are many men in private obstetric practice who do not give their patients these advantages. For such, McCord's figures²⁶ should bring warning. In a series of 519 colored women with positive blood reactions at different periods of gestation, the pregnancies ended disastrously in six per cent of the treated cases as compared with 66.2 per cent of the untreated ones. Roentgen-ray examinations were made upon 73 dead babies of mothers with no treatment and 63 of them showed the characteristic change of congenital syphilis. Examination of 67 babies of treated mothers produced ten positive results, eight of which occurred in babies born of women who had received not more than seven treatments. In McCord's opinion safety for the baby demands not less than ten treatments during pregnancy, though, as Rutledge²⁷ declares, the earlier in pregnancy treatment is begun, the better are the chances for a healthy baby, but good can be accomplished by treatment as late as the eighth or ninth month. Rutledge goes so far as to say that every pregnant woman with a history of syphilis should receive treatment throughout gestation irrespective of the duration of her infection and of previous treatment or the length of time the blood reactions have been negative. Seemingly healthy wives of husbands with treated syphilis should receive treatment during pregnancy, especially if the husband's infection is of less than five years' duration. Spiegler²⁸ says that all women who have ever had syphilis should be treated during pregnancy unless the blood and spinal fluid examinations show that they are cured, but in his experience cases in which a cure has been demonstrated are so few that one might say that all women with a history of syphilis should be treated during pregnancy.

Research is trying to find the cause of prophylaxis by means of drugs. Levaditi²⁹ thought that results might be obtained from a drug which is slowly eliminated and he tried bismuth. He found that it protected rabbits for at least 152 days, while Sonnenberg³⁰ made a clinical experiment on prostitutes. He gave 60 prostitutes weekly intramuscular injections of bismuth and used 50 untreated prostitutes as controls. Forty per cent of the untreated group acquired syphilis while only a little more than eight per cent of the treated girls developed the disease. Stovarsol (acetarsone), an arsenical to be given orally, which has been recommended as an unusually effective specific³⁰ is not approved by Kolmer and Rule³¹ for the abortive treatment of syphilis in human beings.

For other use than for prophylaxis, stovarsol has been reported contradictorily, and the workers at the laboratory of the Research Institute of Cutaneous Diseases at Philadelphia³² felt that the drug was worth careful study. They found that as ordinarily prepared it contained many impurities which may account for the inconsistency of results. After purification they found the toxicity low enough so that they feel it is probably useful for patients intolerant to the arsphenamine group. Of late some of the writers of recent articles recommend its use in congenital syphilis. Abt and Traisman³³ consider it the drug of choice with children because of its easy administration. Children must be watched during treatment, however, for Maxwell and Glaser³⁴ have experienced some severe reactions, even with one death in their series. Its usefulness in infants has been further endorsed by Rosenbaum³⁵, Mettel³⁶, and von Kiss³⁷. Raiziss and Severac³² find it satisfactory in experimental syphilis and capable of penetrating into the central nervous system and of use, probably, in neurosyphilis. Oppenheim³⁰ considers that it is indicated in laryngeal and pharyngeal gummata as well as in severe internal syphilitic affections and in the prophylaxis and treatment of paralysis and tabes.

For two years Gennerich³⁸ has been investigating a new mercury preparation, colloidal mercury sulphide. He finds it extraordinarily efficacious, well tolerated, and active. It may be used orally, intramuscularly, or intravenously, preferably the latter. It is intensely effective for all stages of syphilis, both clinically and serologically, but should not be used to displace arsphenamine, unless the latter is for some reason contraindicated, as it is less active.

A study of treatment results in the human patient is complicated and requires a very large amount of clinical material, more than is available for study in any one of the largest and best organized clinics, therefore Clark, Parran, and the chiefs of the clinics who had cooperated with the League of Nations in a health study a few years ago, decided to utilize the data, which had been compiled for that purpose, in a new detailed study of the value of the various drugs in the treatment of syphilis³⁹. This is an extremely valuable contribution, but impossible for condensation to the limits of a review of this kind. Those interested will find the articles well worth reading.

In determining whether arsenicals can be given to a patient who has had arsenical dermatitis, Schoch⁴⁰ recommends the patch test with neoarsphenamine.

Bismarsen has been used on congenital syphilitic children and observed one and one-half to two and one-half years. It has given apparently valuable therapeutic results with good effect on interstitial keratitis⁴¹. We have had

few reports on the use of bismuth in syphilis of the bones, but Wright⁴² describes the healing of extensive osteomyelitis with intramuscular injections of potassium bismuth tartrate. The rapid fall of the fever and the improvement clinically indicate that this is as specific as the arsphenamines.

For cardiovascular syphilis the arsenicals in order of choice as given by Moore, Danglede, and Reisinger⁴³ are neoarsphenamine, bismarsen, and silver arsphenamine. Hazen⁴⁴ is convinced that carefully individualized thorough treatment, starting with mercury or bismuth, possibly combined with the iodides and later followed by alternating courses of the arsenicals and bismuth, definitely increases life expectancy for these patients. He advocates the close supervision of a competent internist throughout the course of antisyphilitic treatment. A critical review of the diagnosis and treatment of syphilis of the aorta and heart has been made by Coombs⁴⁵ and given with a bibliography of over two hundred references.

Atropin sulphate intravenously was used successfully in about thirty cases of tabetic crises⁴⁶ in doses of not more than three milligrams. Subcutaneous atropin and mercury cyanide intravenously have been used in tabetic atrophy with good results⁴⁷.

As a result of experiments made by Raiziss and Severac³⁸ the rabbit may now be utilized for the study of drugs and other curative agents on syphilis of the central nervous system. It has been discovered that spirochetes that have passed through generations of mice acquire the property of being able to penetrate into the brains of rabbits. Mice which had been inoculated with syphilis experimentally were found to show spirochetes in the inguinal and axillary glands in about 50 per cent of the cases⁴⁸. The virulence of the glands did not correspond to the spirochete content. This is given as an other argument in favor of the theory that syphilitic virus passes through an evolutionary stage that is infraviable before it reaches the visible and virulent stage represented by the spirochete. In inoculating experimental animals, the intracardiac route has been pronounced safe⁴⁹.

Martin and Leger⁵¹ have applied their eight months' rule to a large series of cases and there has never been an exception. The rule is that after the last dose of arsenic has been given and the flocculation in the blood reduced to zero, an examination should be made monthly for eight successive months. If during that time there has been no recrudescence the patient can be pronounced cured.

The effect of attenuated virus on the chimpanzee as regards immunity is the basis of interesting studies⁵². The Truffi strain of syphilitic virus isolated in 1908 by subcutaneous inoculation into rabbits from a human case was tested in

1914 and found pathogenic for monkeys, but less so for man, in whom at that time and in 1922 it caused only a papule not followed by primary or secondary lesions, although the serum reaction was positive. In 1931, after twenty-three years, the only form of inoculation that was virulent was a subscrotal graft tested on the chimpanzee and no ulceration followed. The authors are continuing their studies to determine whether its pathogenic activity can be still further weakened by passage through mice.

Two cases of sudden death from cisternal puncture⁵³ emphasize the fact that while technically not difficult this operation requires experience which should be gained on the cadaver.

The League of Nations at a meeting in Geneva in September, 1932 made certain recommendations based on the results of the laboratory conferences held in Copenhagen in 1923, 1928, and in Montevideo in 1930 that whenever possible, two, and better still, three methods of testing blood should be used, one preferably being the Wassermann. If, for any reason one method only is possible, a flocculation method may be used as the best ones proved superior to the best Wassermann tests in sensitiveness and their equals in specificity.⁵⁴ (A uniform international method of notation of results should be employed, in their opinion.) A new test of this sort has been described by Harry Eagle from the Syphilis Division of Johns Hopkins using sitosterol (corn germ sterol) as a fortifying agent.⁵⁵ In a test of 1600 serum specimens by the Kolmer, Kahn, and Eagle techniques, Levine and Bromberg⁵⁶ found this new test practical as a laboratory aid in the diagnosis of syphilis with a reaction range not completely coincidental with the reaction ranges of either of the other two. The reading of weaker reactions was difficult but the frankly positive reactions were easy to evaluate. Bodansky⁵⁷ also found the Eagle test possessed a high degree of accuracy and reliability in a series of over 3,000 consecutive cases.

Hinton⁵⁸ has presented a third modification of his glycerol-cholesterol precipitation test which first appeared in 1927. In its modified form the test is more accurate and the technique simplified. The superiority of this test in the management of syphilis seems apparent from the fact that its positive reactions generally persist a third longer (sometimes twice as long) than positive Wassermann reactions, and neither rheumatic fever nor pneumonia appears to produce false positives. In a study of 161 cases of known syphilis in which 929 Hinton tests were made, there occurred only six per cent false negatives.

A study of 4,458 blood specimens using the Kahn and Kline tests⁵⁹ showed these tests in complete agreement in 98.9 per cent of all cases

examined. The Kline test seems slightly more sensitive in treated cases and hypersensitive in cases with no antisyphilitic treatment, showing more false positives.

Because of the advantage of early diagnosis and hoping to find a test which would be positive earlier than the blood, Chargin, Eller, and Rein⁶⁰ experimented with the serum from chancres, using the microscopic slide precipitation test. Such tests had been attempted with the Wassermann and Kahn techniques some years ago with no conclusive results. This time the results indicated that tests on fluid from local sores were less sensitive apparently than tests performed simultaneously on blood serum.

At the Peiping Union Medical College Hospital, Dorothy and Amos Wong⁶¹ studied the milk and blood from 140 nonsyphilitic and 11 syphilitic women. They conclude that the Wassermann and Kahn tests of human milk are not sufficiently reliable to permit its use as an alternative for blood.

As a less hazardous agent for producing fever than malaria radiotherapy has been introduced. Hinsie and Blalock⁶², using an apparatus constructed on the same principle as a short-wave radiotransmitter excepting that the energy is concentrated between two condenser plates instead of being directed from an aerial, treated by this means 68 patients with general paralysis. Six months after treatment the results were remissions 12, improved 24, unimproved 26, died six, while the same number of patients treated with malaria gave remissions 13, improved 24, unimproved 21, died 10.

Interesting conclusions have been arrived at in several directions. Ruge⁶³ is inclined to believe that arsphenamine jaundice and catarrhal jaundice are the same disease. He analyzed 2,500 cases of the latter which occurred in the German navy from 1919 to 1929. He explains the greater number of cases among syphilitics as due to the weakened condition of the liver which has sustained syphilis and arsphenamine administration. O'Leary⁶⁴ finds after careful study of a considerable series of cutaneous late syphilis that approximately 50 per cent of these patients have demonstrable signs of visceral syphilis or neurosyphilis, but usually of a mild nature, thus exploding a very general erroneous idea that cases with late skin lesions do not have other types of late syphilis. A case of syphilitic involvement of the left common peroneal nerve occurring thirty-six years after the primary lesion⁶⁵ is extremely rare but is worth attention because of the danger of confusion with a neuritis due to numerous causes. Four cases of Charcot's disease of the knee have been reported in which solid bony fusion resulted in three so that the patients were able to walk without any artificial support. Cleveland and Smith, the au-

For other use than for prophylaxis, stovarsol has been reported contradictorily, and the workers at the laboratory of the Research Institute of Cutaneous Diseases at Philadelphia⁵² felt that the drug was worth careful study. They found that as ordinarily prepared it contained many impurities which may account for the inconsistency of results. After purification they found the toxicity low enough so that they feel it is probably useful for patients intolerant to the arsphenamine group. Of late some of the writers of recent articles recommend its use in congenital syphilis. Abt and Traisman⁵³ consider it the drug of choice with children because of its easy administration. Children must be watched during treatment, however, for Maxwell and Glaser⁵⁴ have experienced some severe reactions, even with one death in their series. Its usefulness in infants has been further endorsed by Rosenbaum⁵⁵, Mettel⁵⁶, and von Kiss⁵⁷. Raiziss and Severac⁵² find it satisfactory in experimental syphilis and capable of penetrating into the central nervous system and of use, probably, in neurosyphilis. Oppenheim⁵⁰ considers that it is indicated in laryngeal and pharyngeal gummata as well as in severe internal syphilitic affections and in the prophylaxis and treatment of paralysis and tabes.

For two years Gennerich⁵⁸ has been investigating a new mercury preparation, colloidal mercury sulphide. He finds it extraordinarily efficacious, well tolerated, and active. It may be used orally, intramuscularly, or intravenously, preferably the latter. It is intensely effective for all stages of syphilis, both clinically and serologically, but should not be used to displace arsphenamine, unless the latter is for some reason contraindicated, as it is less active.

A study of treatment results in the human patient is complicated and requires a very large amount of clinical material, more than is available for study in any one of the largest and best organized clinics, therefore Clark, Parran, and the chiefs of the clinics who had cooperated with the League of Nations in a health study a few years ago, decided to utilize the data, which had been compiled for that purpose, in a new detailed study of the value of the various drugs in the treatment of syphilis⁵⁹. This is an extremely valuable contribution, but impossible for condensation to the limits of a review of this kind. Those interested will find the articles well worth reading.

In determining whether arsenicals can be given to a patient who has had arsenical dermatitis, Schoch⁴⁰ recommends the patch test with nearsphenamine.

Bismarsen has been used on congenital syphilitic children and observed one and one-half to two and one-half years. It has given apparently valuable therapeutic results with good effect on interstitial keratitis⁴¹. We have had

few reports on the use of bismuth in syphilis of the bones, but Wright⁴² describes the healing of extensive osteomyelitis with intramuscular injections of potassium bismuth tartrate. The rapid fall of the fever and the improvement clinically indicate that this is as specific as the arsphenamines.

For cardiovascular syphilis the arsenicals in order of choice as given by Moore, Danglede, and Reisinger⁴³ are nearsphenamine, bismarsen, and silver arsphenamine. Hazen⁴⁴ is convinced that carefully individualized thorough treatment, starting with mercury or bismuth, possibly combined with the iodides and later followed by alternating courses of the arsenicals and bismuth, definitely increases life expectancy for these patients. He advocates the close supervision of a competent internist throughout the course of antisyphilitic treatment. A critical review of the diagnosis and treatment of syphilis of the aorta and heart has been made by Coombs⁴⁵ and given with a bibliography of over two hundred references.

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THE VINEGAR OF THE FOUR THIEVES

BY CHARLES H. LA WALL

Dean of the Philadelphia College of Pharmacy
and Science

One of the eighteenth century glass stoppered shelf bottles in the ancient pharmacy of E. R. Squibb & Sons exhibited this last summer at the Century of Progress Exposition in Chicago is labeled *Acetum Bezoardicum*

Now this name is unintelligible and untranslatable to the average member of either the medical or the pharmaceutical profession.

If one who is curious takes the trouble to look up the meaning of the word "bezoar" he will find that it applies to a concretion or calculus found in the intestinal tract of certain kinds of animals particularly the herbivorous, and that it was once highly esteemed for its antidotal virtues

If one consults a medical or pharmaceutical authority of the eighteenth century or earlier on the subject of bezoar it will be found that the faith in the efficacy of this drug was so strong that it was believed that 'no poison, no eruptive pestilential or putrid disease, could resist its influence'

Satisfied with this definition the average investigator would dismiss the subject at this point with the assumption that *Acetum Bezoardicum* was a preparation of bezoar in vinegar (*acetum*). But there is a much more interesting tale connected with this name and with this preparation

It is in reality made from aromatic spices and garlic, extracted with vinegar, and no 'bezoar' entered

into its composition at all, but the adjective "bezoardic" was intended to have a generic meaning of *antidotal*, as applied to this particular preparation, but to no other, for there were a number of preparations into which bezoar actually entered as an ingredient in the days when it was held in high repute

If the searcher looks still further he will find that it was called "*Gewürz Essig*" (spice vinegar) "*Pest Essig*" (plague vinegar) "*Acetum Prophylacticum*" (prophylactic vinegar) and "*Vinaigre des Quatre Voleurs*" (vinegar of the four thieves), and that it had a most unusual history

The story told of its origin is that during an epidemic of 'the plague' in Marseilles in the early part of the eighteenth century four robbers, by the use of this prophylactic attended without harm hundreds of dead and dying citizens and under the guise of these disinterested services they robbed their victims, and that one of them upon being caught confessed their crimes and saved himself from punishment by divulging the composition of the preventive they had employed to pursue their nefarious practices

The belief in this fanciful tale was so strong that the preparation soon attained a wide sale in both Europe and America and this sale continued for more than a century

The interesting part of the story is that a modified form of this same remedy is still official in the National Formulary of the United States and in a number of foreign pharmacopoeias as well under the name of Aromatic Vinegar

thors⁶⁵, hesitate to generalize from four cases but they hope the method will be tried by others

While most physicians feel that it is dangerous to treat children with congenital syphilis during intercurrent secondary infections such as otitis media, bronchitis, or pneumonia, Lewin⁶⁶ thinks that there is much more danger of recurrences if treatment is not given than there is danger from the treatment in the presence of infection. He has often noticed the first signs of congenital syphilis developing during or immediately after an acute infection.

Malaria is on the increase in Indiana⁶⁷ and it has been suggested that there is a connection between the increase and the use of malaria as a therapeutic agent.

Contrary to the symptoms often quoted in textbooks, Hewer⁶⁸ finds that there is little evidence that increased cerebrospinal fluid pressure is either a common or reliable indication of syphilis of the nervous system.

For some years attempts have been made to decide whether or not yaws and syphilis are identical. Turner and Chambers⁶⁹ record their experience in transferring the virus of yaws to rabbits and monkeys. In inoculating rabbits with material from ten different patients with yaws, lesions developed after testicular inoculation, and the organisms were recovered after two passages through rabbits. Five monkeys were inoculated but there was no assurance that the organisms were transmitted, though lesions were produced. The absence of syphilis in Fiji, Solomon Islands, and New Guinea is considered due to wide distribution of yaws⁷⁰ which raises the question whether the treatment of this disease in the Pacific will not suppress or reduce this immunity.

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A lumbar puncture was normal except for positive alcohol and ammonium sulphate tests. Operation was performed. He did poorly postoperatively and died the following day.

CLINICAL DISCUSSION

DR COHEN The operation at the second admission was a frontal osteoplastic craniotomy. The brain bulged strongly on opening the dura. The pituitary was exposed with much difficulty. In the pituitary region there appeared to be a fairly large new growth, the anterior portion of which was removed. During the operation the frontal lobe was considerably torn. The dura could not be resutured. The orbital ridge and bone flap were replaced.

DR GEORGE W HOLMES These films are not from our laboratory. Those of you who are near enough can see the broad sella with absence of the posterior clinoid.

These films were taken here. This is the site of the operative field. There is a dense shadow below it that may be a fragment of bone or a localized area of calcification. The posterior clinoids are gone. There is calcification here about which I am not certain. Such extensive erosion of the posterior clinoids without involvement of the anterior clinoids would suggest a tumor outside the sella. On the other hand a tumor outside the sella that destroyed the posterior clinoid processes would also cause increased intracranial pressure, which this has not done. So we have to assume that the tumor is either within the sella or close to it. A tumor in another part of the brain pressing downward and destroying the clinoid processes by pressure would also show prominent skull markings. It is possible that the decompression operation prevented the formation of that evidence.

DR W JASON MIXER This history goes back quite a long way. If I remember rightly it was the first transfrontal operation that I ever did on a pituitary tumor, one of the very early ones at any rate.

There is one interesting point that comes up in regard to the operation which has not been brought out that is that the technic used at that time called for removal of the supraorbital ridge in order to give one a more direct exposure of the chiasm under the frontal lobe. We have since found that such a procedure is unnecessary and it has been given up. It was done however in this case and the supraorbital ridge, a more or less wedge-shaped piece of bone about 2.5 or 3 centimeters in greatest diameter, was removed and set aside to be put back again at the end of the operation. Unfortunately, due to some oversight during the operation the piece of bone was thrown into the bucket with the dirty sponges. We were a little nonplussed to know what to do about it, but we put it into the instrument boiler and boiled it and put it back in again. I do not know how much in the way

of the use of boiled bone had been done at that time. It caused no trouble except a little displacement downward, which accounted possibly for the downward displacement of the eye throughout the rest of his life.

That is the most interesting thing that happened in the early days. I think it is quite interesting to know that that piece of bone should have remained in his skull, or have been replaced in his skull by living bone, throughout this period of time.

DR TRACY B MALLORY Dr Putnam, will you tell us about your findings at the last operation?

DR TRACY J PUTNAM This patient's condition and also his family's condition were pretty desperate and seemed to us to demand a desperate remedy. It seemed to us there was not a great deal of chance that we could get out the rest of the tumor, which had obviously grown a great deal since the first operation, because his condition was becoming progressively worse.

The first thing that attracted my attention on reopening Dr Mixer's old wound was a large cyst replacing perhaps two-thirds of the right frontal lobe. This communicated with the ventricle and was crossed by a few filmy spider-web-like strands floating in fluid. When these were brushed away it was possible to see the tumor, which was perhaps the size and color of a plum, slightly flattened over the floor of the skull. Through it ran the right optic nerve, and I gently dissected it. It ran into both temporal lobes and the left frontal lobe. I proceeded to dislocate it and to take off the small pieces. With one of these small pieces there came a tremendous amount of bleeding which I presume was from the anterior cerebral artery, which was entirely surrounded by the tumor. I controlled the bleeding by packing and backed out, but it was quite evident that he had not long to live.

CLINICAL DIAGNOSIS

Recurrent pituitary tumor

ANATOMIC DIAGNOSES

Adenoma of the pituitary, chromophobic type

Arteriosclerosis coronary, moderate, aortic, slight

Obesity

Intracranial hemorrhage, postoperative

Operation craniotomy and partial removal of tumor

Atrophy of the frontal pole. Porencephaly?

Bone graft of skull

PATHOLOGIC DISCUSSION

DR CHARLES S KUBIK There is a large funnel-shaped defect of the right frontal pole com-

CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 20021

PRESENTATION OF CASE

DR. ROY B. COHN * *First admission* A forty-seven year old married Canadian teamster entered for the first time fourteen years before his fifth and last entry.

Eleven months before admission he noticed that he was developing great difficulty in reading. One month later he was forced to give up his work as driver of a laundry wagon because of inability to read the score book. This impairment in vision became steadily worse. In addition he began to have four or five periods a day during which he was unable to see anything. These periods were associated with headaches and pain beginning in the eyes and extending downward to the back of his neck. They were not accompanied by dizziness, nausea or vomiting. These attacks of blindness began as though a blanket had been thrown over his eyes, and after five or six minutes the clouds spread from within outward. The left eye was from the start more affected than the right.

His family, marital and past histories are irrelevant.

Physical examination showed a well developed and fairly obese man. The chest and abdomen were negative. The fundi showed pale disks with clean cut edges. He had momentary sensations of foul odors. Neurological examination showed bilateral hemianopsia, slight deafness of the left ear and slight deviation of the tongue to the right.

X-ray examination showed a definitely abnormal sella turcica. The posterior clinoid process was not visible. The floor appeared to be thin.

A blood Wassermann was negative. The spinal fluid showed twenty cells and positive alcohol and globulin tests.

He was discharged to return later for operation.

Second admission, three weeks later. Operation was performed. His postoperative course was uneventful and he was discharged relieved.

History of interval He was followed in the Outpatient Department after his discharge. His left eye improved very much. His right eye, however, remained in the same condition. Two days before readmission he fell on his head, and

following that had a discharge of cerebrospinal fluid from his nose at intervals.

Third admission, six months after his second discharge.

He remained in the hospital for about a week, during which time the nasal discharge stopped. He was given a series of x-ray treatments, following which his visual acuity increased. He was discharged at the end of six days.

History of interval He was followed in the Outpatient Department for the next eight years and the following notes were made.

Three years after the third discharge his memory was slightly impaired. Vision of left eye 20/40, of right eye 20/200. He was given more x-ray therapy.

A year later he was symptomless.

The next year he fainted on two occasions without warning. He was given more x-ray therapy.

The following year he had many petit mal attacks without warning.

During the next year he had three attacks. There was only very poor sight in the right eye. He was given more x-ray therapy.

Fourth admission, eight years after his third discharge.

On admission to the wards he was markedly drowsy and showed a partial loss of memory. At other times he was markedly euphoric. The vision of the right eye was 20/200, that of the left eye 20/20. His sense of smell was subjectively diminished. On the right his hearing was a little dull. There were no other abnormalities in his neurological examination.

He was given an x-ray treatment and discharged at the end of a week.

History of interval During the next five years he was followed in the Outpatient Department. The following notes were made.

A year after his fourth discharge the light perception in the right eye was gone. The left eye was apparently normal. He was inclined to be moderately euphoric.

One year and again three years later no change was noted in his visual fields.

The following year, a month before his fifth entry, his epileptic attacks began to increase in number, occurring almost daily. His euphoria became more marked.

Fifth admission, five years after his fourth discharge.

Physical examination on admission to the wards showed a very heavy man in no apparent distress. The left eye was normal. The right had been displaced caudally and showed slight external strabismus. There was no extra-ocular muscle impairment. The right disk was very pale and atrophic, the left was not remarkable. The vision in the right eye remained only in the upper nasal quadrant of the field. The other cranial nerves were normal. He was still rather talkative and euphoric. His reflexes were all sluggish.

*Resident on the Neurosurgical Service

CLINICAL DISCUSSION

DR. WILLIAM B. ROBBINS The only diagnostic point of special interest in regard to this case was that the man had taken care of animals as a child, had been closely associated with them, and had been working on hides and animal products ever since he had been in this country. These facts suggested the possibility of echinococcus cyst.

He had marked disturbance of liver function, with a large irregular liver, when we first examined him. I thought I could feel crepitus over some of these nodules, although they were distinctly hard. The diagnosis lay between possible echinococcus cyst and carcinoma of the liver.

We decided after talking it over with the surgeons that we would do a quick laparotomy to see if by any chance it was echinococcus. That seemed to be the only hope. If we could drain an abscess he might get relief. According to his story he had been rapidly getting worse during the past two months.

Laparotomy was done and carcinoma of the liver was found.

CLINICAL DIAGNOSIS

Carcinoma of the liver

ANATOMIC DIAGNOSES

Primary liver cell carcinoma

Alcoholic cirrhosis of the liver

Splenomegaly

Thrombosis of portal and splenic veins

Bile nephrosis

Ascites

Hydrothorax, right

Jaundice

Old cardiac infarct, posterior wall of the right ventricle

Coronary occlusion with recanalization, right circumflex.

Operative wound, exploratory laparotomy

External strabismus, right

Corneal opacity ? right

Dilatation of esophageal veins

Pulmonary infarct

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY The liver which Dr. Miller came down on when he explored this patient fills this basin. It weighs over six kilos and shows not only a diffuse involvement of almost every part of the liver with carcinoma, but a definite cirrhosis in the few parts of the liver which are not infiltrated with the tumor. A small biopsy specimen was removed from which it was possible to make a diagnosis of primary liver cell carcinoma. That is of course supposed to be a very rare tumor, but in recent years large numbers of them are apparently being recognized in various places in the world. We certainly have had an unusual number here. I think there have been ten cases since I have been here, in a period of six years, at least an average of two a year, so it is common enough even in this region to be well worth considering in diagnosis.

Another entirely unexpected finding in this case was a complete thrombosis of the portal vein, obviously a very fresh and terminal lesion which had produced complete necrosis of the liver from the rapid and complete shutting off of blood in the last few hours of life.

The man also had a very irregular upper surface to his liver beneath the diaphragm, but no chest film was taken at any time, so I do not know whether the diaphragmatic shadow would have been irregular.

municating with the lateral ventricle. The tumor is a large one, from 5 to 6 centimeters in diameter, occupying the region of the optic chiasm and extending upward and to the left, almost completely obliterating the third ventricle and pushing its way into the left temporal lobe. The optic chiasm is destroyed, the optic nerves and optic tracts are flattened and greatly diminished in size.

The sella turcica is enlarged to three or four times its normal size. Its floor is eroded. The anterior clinoid processes are spread apart and thinned out. The posterior clinoids are gone.

The piece of bone which was boiled at the time of the operation has the appearance of normal bone and there is firm bony union between it and the frontal bone.

DR MALLORY. I will not show the sections, but the tumor is composed of the indifferent cells, that is, neither acidophilic nor basophilic, and slowly growing in type.

CASE 20022

PRESENTATION OF CASE

DR THOMAS S. CLAIBORNE. * A forty-five year old single Greek leather worker entered with the complaint of fullness in the stomach and intermittent abdominal pain for the past three years.

Three years before admission he noticed that his abdomen was somewhat larger than usual, especially on the right side. This enlargement had increased, occasionally producing a sense of tightness and often associated with dull aching pain which was intensified on bending over. The pain was intermittent, occurring one day and absent the next. It never prevented him from sleeping, and in fact was less severe when he was lying down. There was no history of edema of the legs or body, although there was some question of puffiness of the face. He never noticed any change in color. Three physicians had told him he had chronic appendicitis. Two months before admission he first noticed an aching pain in the right shoulder region, present along the clavicle and up to the right ear. This pain was not constant and bore no particular relation to the abdominal pain. He had lost fifteen or twenty pounds during the past two months.

His appetite had always been good and had not changed. There had been no change in his bowel habits. There had never been any diarrhea, blood, or clay colored stools. From 1910 to 1928 he worked in a leather factory handling raw hides. Since then he had worked in a shoe factory until four months before admission, when he was discharged following a strike. For the past six or eight years he had been in the

habit of drinking approximately one quart of home-made wine daily. He occasionally took alcohol. About thirty years before admission he was in bed for one week with a chest cold. There was no history of malaria, scarlet fever or typhoid fever. He denied venereal disease both by name and symptom. He was born in Greece, came to Massachusetts at the age of twenty four, and had lived here ever since.

Physical examination showed a well developed and well nourished man in no acute distress. There was a slight icteric tint to the skin and sclerae. His teeth were very poor and there was fairly marked pyorrhea. Examination of the heart and lungs was negative except for soft apical and basal systolic murmurs. The blood pressure was 135/80. The abdomen was protuberant and except for the left lower quadrant was completely filled by the liver. The liver was very hard, irregular, and contained large nodules. Echinococcus crepitus could not be elicited. There was some tenderness in the epigastrium. One examiner believed that he felt the spleen, but was not able to rule out the left lobe of the liver.

The temperature was 99.8°, the pulse 90. The respirations were 20.

Examination of urine showed a specific gravity of 1.028 to 1.030. There was a positive test for bile. Examination of the blood showed a red cell count of 5,500,000 and a hemoglobin of 90 per cent. The white cell count was 8,500 with 64 per cent polymorphonuclears, 22 per cent lymphocytes, 9 per cent large mononuclears and 5 per cent basophiles. The platelets were normal. Examination of the stools showed the presence of starch, fat and muscle fibers. The guaiac test was negative. A Hinton test was negative. A liver function test showed 70 per cent retention. The icteric index was 20 and the van den Bergh 4.74 milligrams per 100 cubic centimeters, direct reaction. A gastric analysis showed free hydrochloric acid and was not remarkable. Both echinococcus fixation and skin tests were negative. The non-protein nitrogen was 25 milligrams, the carbon dioxide combining power 57.5 volumes per cent.

A gastro-intestinal x-ray series showed no definite evidence of disease of the esophagus, stomach or duodenum. The duodenal cap and the second portion of the duodenum showed a slight variation from normal, interpreted as being an extrinsic pressure defect. A barium enema was difficult to interpret because of poor visibility, which was believed to be suggestive of the presence of ascites. There was no definite organic lesion in the colon.

Ten days after admission an exploratory laparotomy was performed. The patient did fairly well following the operation, but on the eleventh day his temperature rose to 101, he became restless, and developed pain in his back. He failed rapidly and died two weeks after operation.

*Senior interne on the West Medical service

THE BURDEN ON HOSPITALS IMPOSED BY AUTOMOBILE ACCIDENTS

Among the unpredictable needs for hospitalization, accidents resulting from the operation of automobiles occupy an important position, ranging from minor to the most important major operations

Fortunately for the injured automobilists, reliable hospitals are not remote from the regular routes, and service is usually available and rendered promptly. With the discharge of the patient, the other side of the picture too often presents complications depending on the ability or disposition of the injured person to meet the charges of the hospital and attending physicians. Both disposition and resources of the recipient of care are often inadequate, involving a loss which too often the hospital and the doctor cannot afford.

Dr John J Moorhead of New York spoke of these unpaid accident charges as a "terrific financial strain on every community" in an address before the Interstate Postgraduate Medical Association of North America recently, and he suggested that appropriations taken from gasoline and road taxes should be made to hospitals to cover this financial burden. As an illustration we quote Dr Moorhead:

"Suppose a man and his family from New York, Illinois, or any other state, come touring through your city. They have an accident. They are taken to one of your hospitals. They receive treatment that runs anywhere from a single dressing to two or three weeks of hospitalization or even more.

"They recover. They tell you they are grateful for the treatment, but have no money to pay. There is nothing the hospital can do about it. Everybody is just out of luck."

We wish to add to the above that any diversion of tax funds to pay for automobile accidents should include physicians as well as hospitals.

PROFESSOR SIGERIST AT THE BOSTON MEDICAL HISTORY CLUB

At the meeting of the Boston Medical History Club to be held at the Boston Medical Library, Monday, January 15*, Professor Sigerist will talk on his recent trip to Italy in search of medical manuscripts. Material of the greatest importance to doctors and medical historians, much of it unique and not previously published, will be presented. An opportunity is thus offered to the medical profession to hear a distinguished historian discuss in an informal manner a subject about which little is known. The medical manuscripts owned by the Boston Medi-

cal Library will be on exhibit. Of particular interest will be rare Hebrew manuscripts, recently acquired.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

LAHEY, FRANK H. M.D. Harvard University Medical School 1904. F.A.C.S. Director, Lahey Clinic. Surgeon-in-Chief, New England Baptist Hospital. Surgeon, New England Deaconess Hospital. Address 605 Commonwealth Avenue, Boston. Associated with him is

JORDAN, SARA M. A.B., Ph.D., M.D. Tufts College Medical School 1921. Gastro-enterologist, Lahey Clinic. Associate Staff, New England Deaconess Hospital, New England Baptist Hospital and Robert Breck Brigham Hospital. Address 605 Commonwealth Avenue, Boston. Their subject is "Cancer of the Stomach" Page 59.

TRUESDALE, P. E. M.D. Harvard University Medical School 1898. F.A.C.S. Surgeon, Truesdale Clinic, Fall River, Massachusetts. His subject is "Acute Pancreatitis—With a Review of Fifty-four Operative Cases" Page 66. Address 151 Rock Street, Fall River, Mass.

CARY, EDWARD H. LL.D., M.D. University and Bellevue Hospital Medical College 1898. F.A.C.S. Professor of Ophthalmology and Otolaryngology, Baylor University College of Medicine. Emeritus Dean and Chairman of the Department, Diseases of Eye, Ear, Nose and Throat, Baylor University College of Medicine. President, American Medical Association, June 1932-June 1933. His subject is "The Public and Our Profession" Page 72. Address 1717 Pacific Avenue, Dallas, Texas.

ROOT, HOWARD F. See page 44, issue of January 4, for record of author. His subject is "The Association of Diabetes and Tuberculosis II. Pathology and Etiology" Page 78.

NISSEN, H. ARCHIBALD AND SPENCER, K. A. See page 44, issue of January 4, for record of authors. Their subject is "Arteriosclerosis and Arthritis" Page 92.

CHEEVER, AUSTIN W. A.B., M.D. Harvard University Medical School 1914. Assistant in Dermatology and Syphilology, Harvard Medical School. Assistant Dermatologist, Children's Hospital. Visiting Dermatologist, Beth Israel Hospital, Boston. Consulting Dermatologist, Framingham-Union, Waltham, Goddard, and Brockton Hospitals. His subject is "Progress in the Diagnosis and Treatment of Syphilis, 1931-1932" Page 97. Address 472 Commonwealth Avenue Boston.

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EPIDEMIC ENCEPHALITIS

THE cases of encephalitis which were reported in epidemic numbers in St. Louis and Kansas City in August and September of 1933 should not be confused with those of lethargic encephalitis or "sleeping sickness" which occurred with such frequency throughout the civilized world ten to fifteen years ago. Leake¹ of the United States Public Health Service has called attention, in these cases, to the lack of ophthalmic symptoms, the practically uniform meningeal involvement and the prompt and complete recovery in the non-fatal cases. These characteristics agree with those of encephalitis "B," the name which Kaneko and Aoki² have given to cases of encephalitis which have occurred in epidemic form in Japan, particularly during August and September of 1919 and 1924. The Japanese workers consider lethargic encephalitis or encephalitis "A" to be an en-

tirely different disease entity, characterized by slower and milder onset, longer duration, lower mortality, and the frequent presence of the Parkinsonian syndrome as a sequela. Histologically, the brain and meninges from cases of encephalitis "B" showed more diffuse lesions than the characteristic perivascular round cell infiltrations of encephalitis "A." In both, the demyelination occurring in post-vaccinal encephalitis or that following other infections, such as measles, was lacking.

Although isolated workers have claimed that a filterable virus is the etiological agent in encephalitis "A," such claims have not been substantiated to the satisfaction of investigators in general. A far greater number of positive experiments have been carried out with material from cases of encephalitis "B." As cited by Kaneko and Aoki², spirochetes and Gram-positive diplococci have been isolated, both of which have been considered the causative agent by certain groups of Japanese workers. By far the majority of experimental work in Japan, however, has led to the conclusion that encephalitis "B" is caused, primarily, by a filterable virus. Positive transfers of brain emulsion, cerebrospinal fluid and blood from human cases and brain emulsion from infected animals have been reported in rabbits, monkeys, rats, guinea pigs and mice. Berkefeld filtrates have been infective, as have glycerinated brain emulsions kept at icebox temperature for three months. Preliminary reports of animal transfer experiments with material from cases in this country have given results which also point to a filterable virus as the etiological factor. Muckenfuss, Armstrong and McCordock³ have been able to transfer and establish the disease in monkeys and to retransfer to mice. Webster and Fite⁴ have reported a high percentage of positive primary and secondary intercerebral transfers into a strain of mice known to be extremely susceptible to an infectious encephalitis of sheep. *Macacus chesus* monkeys were susceptible, but the disease was not fatal, though transferable. Ordinary cultures of the infective material have been consistently sterile and Berkefeld filtrates have been infective.

Confirming Takaki⁵, Webster and Fite have demonstrated the presence of specific protective substances in the sera from convalescent cases. Sera from normal adults in New York have failed to show protective qualities. Such findings suggest the use of convalescent serum as a therapeutic agent, but, in view of the questionable value of such serum in the treatment of anterior poliomyelitis, too much should not be expected.

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- 1 Leake J. P. J. A. M. A. 101 9*8 1933
- 2 Kaneko R. and Aoki Y. *Ergebn. d. inn. Med. u. Kinderh.* 34 342 1928
- 3 Muckenfuss R. S. Armstrong C. and McCordock, H. A. *Pub. Health Rep.* 48 1241 1933
- 4 Webster L. T. and Fite G. L. *Science.* 78 463 1933
- 5 Cited by Kaneko and Aoki. *Loc. cit.*

definition of the practice of Optometry and a suggestion that the board shall have power to make extended rules and regulations relating to the practice of Optometry

The Massachusetts Medical Society

AN URGENT PROTEST ADOPTED AT A MEETING OF THE COMMITTEE ON PUBLIC RELATIONS HELD IN BOSTON, JANUARY 2, 1934

Whereas, the Civil Works Administrator of the United States, Harry L. Hopkins, has instructed John J. Morris Counsel for the Civil Works Administration of Massachusetts, to place all employees injured in the Civil Works program under the Federal Compensation Act and

Whereas this procedure is antagonistic to the Massachusetts Law for workmen's compensation in so far as it deprives the injured workman of the right to select his own physician,

Be it resolved that the Massachusetts Medical Society, composed of four thousand and nine hundred Massachusetts physicians, acting through the Committee on Public Relations, protest the application of the Federal Compensation Act to the Civil Works program in Massachusetts and

Be it further resolved that we respectfully urge that the man injured in Civil Works program has the right to select his own physician.

Members of the Committee present were Dr. William H. Robey, Dr. Elmer S. Bagnall, Dr. John H. Blaisdell, Dr. William G. Curtis, Dr. Fred R. Dame, Dr. Francis H. Dunbar, Dr. Walter A. Lane, Dr. William F. MacKnight, Dr. Stephen A. Mahoney, Dr. Richard A. McGillicuddy, Dr. Charles E. Mongan, Dr. P. J. Sullivan, Dr. M. A. Tighe, Dr. J. I. B. Vall and Dr. Harper E. Whitaker

After adoption of this protest, it was voted to send a copy to the following

Franklin D. Roosevelt, President of the United States

Harold L. Ickes, Secretary of the Interior
Harry L. Hopkins, Relief Administrator
David L. Walsh, Senator of Massachusetts
Marcus A. Coolidge, Senator of Massachusetts
Representatives of Massachusetts, 115 Districts
Olin M. West, Secretary, American Medical Association, 535 North Dearborn Street, Chicago, Illinois
Morris Fishbein, Editor *Journal of the American Medical Association*

William C. Woodward, Bureau of Legal Medicine and Legislation, American Medical Association, Chicago

Dean Lewis, President, American Medical Association, Johns Hopkins University, Baltimore, Md.

RECENT DEATHS

KOTLER — **MOSES G. KOTLER, M.D.**, died on January 7 at the Malden Hospital after an illness of less than a week. He was thirty-eight years of age. For nearly two years Dr. Kotler had been city physician of Malden, and it is said that overwork in this capacity contributed to his early death. During the World War he served with the Students' Army Training Corps and later was attached to the Veterans Bureau in Washington.

Born in Russia, Dr. Kotler came to America when very young and was educated in the Boston public schools. He later attended Tufts and was graduated from the Tufts Medical School in 1920. He is survived by a widow, Mrs. Anna G. Kotler, two children, Alvin, 9, and Theodore, 5, his parents, Mr. and Mrs. Harry Kotler of Dorchester, and one sister, Mrs. Ruth Shimberg, also of Dorchester.

STONE — **BRYON STONE, M.D.** died suddenly at his home in White Village on December 28 at the age of eighty-two years. He was born in North Oxford, and after graduating from the Oxford High School, attended Worcester Academy and Worcester Polytechnic Institute. He received his medical degree at Jefferson Medical College in 1877, and had been a practicing physician for fifty-six years.

DIKE — **JOHN DIKE, M.D.**, a graduate of Bowdoin College in the class of 1880 and of the Boston University School of Medicine in 1888, died at his home in Melrose on January 2, after a short illness. He had been for forty-five years a practicing physician of Melrose, where he was formerly a member of the school committee and served a number of terms as a member of the board of aldermen and as its president. He was at one time chairman of the Melrose Republican City Committee.

Dr. Dike is survived by his widow, Mrs. Mary Dike, four sons, Donald, Eben, Samuel W. and John K. Dike, one daughter, Miss Mary K. Dike, and nine grandchildren.

DOY — **WILBERFORCE CLARKSON DOY, M.D.**, died at his home, 1334 Commonwealth Avenue, Allston, after an illness of four months at the age of eighty-two years. Born in Rochester, New York, Dr. Doy was a graduate of the Cleveland Medical School and had been a local practitioner for fifty years. He is survived by his widow, a brother, William S. Doy of Battle Creek, Michigan, and two nieces.

NOTICES

AWARD

The New England Society of Psychiatry at its next Spring meeting, will make two awards, one of \$100.00 and one of \$50.00 to the writer (or writers) of the best papers completed or published during the calendar year of 1933 embodying research in psychiatry by a younger worker (or workers). Phy

MASSACHUSETTS LEGISLATIVE NOTES

The following described bills have been filed

- S 16 is designed to regulate the practice of surgery, and reads

A physician shall not remove any limb or organ of the body from a patient, without first obtaining consent of such patient, if the patient is mentally and physically capable of giving such consent, otherwise he shall obtain the consent of the patient's husband or wife or nearest available relative or of the patient's parents or guardian.

If such consent is not available, the physician may proceed upon his own judgment

- S 5 provides that

The board of health in cities and towns shall have authority to fix the territorial limits or milk shed within which milk shall be produced before licenses may be issued for the sale thereof. In case of an emergency or milk shortage, the milk inspector or other licensing authority may, if necessity and convenience require, grant licenses to suitable persons although the milk is produced beyond the prescribed milk shed or territorial limits

- H 103 is an Act relative to Workmen's Compensation Insurance Policies, Mergers of Insurance Companies, and Certain Insurance Brokers' Licenses issued to Partnerships, and is also relative to certain obligations of the Insurance Companies

- H 101 is an act relative to providing Compensation under the Workmen's Compensation Law for Children of Deceased Employees in Case there is no Surviving Dependent Parent, and reads as follows

If there is no surviving wife or husband of the deceased employee, such amount or amounts as would have been payable under this section to or for the use of a widow and for the benefit of all the children of the employee, shall be paid in equal shares to all the surviving children of the employee

- H 31 reads

Whoever sells arsenic (arsenious acid), atropia or any of its salts chloral hydrate, chloroform, cotton root or its fluid extract, corrosive sublimate, cyanide of potassium, Donovan's solution, ergot or its fluid extract, Fowler's solution, oil of pennyroyal, oil of savin, oil of tansy, Paris green, Parson's vermin exterminator, phosphorus, prussic acid, 'rough on rats,' strychnia or any of its salts, tartar emetic, tincture of aconite, tincture of belladonna, tincture of digitalis, tincture of nux vomica, tincture of veratrum viride, compounds of fluorine, or carbolic acid, shall affix to the bottle, box or wrapper containing the article sold, a label of red paper upon which shall be printed in large black letters the

name and place of business of the vendor and the words "Poison" and "Antidote," and the label shall also contain the name of an antidote, if any, for the poison sold.

This bill has to do with the restriction and control of the sale of such articles

- H 127 provides for a change in Section 66 of Chapter 111 of the General Laws in that the charges for the support of an inmate in a state sanatorium shall be seven dollars per week to be paid quarterly and provision for collecting charges of indigent inmates if or when such may be able to pay with certain specified obligations of kindred or towns

- H 126 provides in substance for the compulsory vaccination of pupils in private as well as public schools

- H 156 is relative to increasing the Payments for Deaths resulting from Industrial Accidents, and reads as follows

Section thirty-one of chapter one hundred and fifty two of the General Laws is hereby amended by inserting in place of "ten dollars" per week the amount of "fourteen dollars" per week and in place of "twelve dollars" per week the amount of "eighteen dollars" per week, and in place of "two dollars" more per week the amount of "four dollars" more per week, that the provision that in case any such child is a child by a former wife, the death benefit shall be divided between the surviving wife and all living children of the deceased employee in equal shares, the surviving wife taking the same share as a child be stricken out and the following words inserted therein — provided, that in case any such child is a child by a former wife, the death benefit shall be paid as follows the surviving wife shall receive fourteen dollars per week and all living children of the deceased employee entitled to receive compensation under section thirty two shall each receive four dollars per week, but said children shall not receive more than the total of eighteen dollars per week,— that the words "if and so long as there are five or less, three dollars a week" be stricken out, and that starting with the paragraph "In all other cases of total dependency, the words "but not more than ten dollars nor less than four dollars a week" be stricken out and the following words be inserted in place thereof — but not more than eighteen dollars nor less than fourteen dollars a week,—and the words "sixty four hundred dollars" be inserted in place of "four thousand dollars"

- H 147 is a draft of an act to make uniform the law with reference to narcotic drugs

- H 125 is based on the report of the Board of Regulation in Optometry, and recommends changes in the time for meetings, better

her skin showed a salmon pink color. The artery supplying the superior pole of the thyroid was ligated with subsequent temporary improvement. Subtotal thyroidectomy was followed by somewhat more lasting improvement. At the age of thirty she returned to the hospital and was treated with Lugol's solution which gave symptomatic relief. She recently reentered the hospital on the Medical Service with a complaint of anorexia. Her gray hair and salmon pink skin were striking. A bruit was heard over the thyroid. There was slight exophthalmos but no other accompanying eye signs.

The cases were discussed by Drs Fitz, Levine, and Means. Dr Fitz briefly recounted the history of hyperthyroidism from its clinical recognition by Parry, Graves, and Basedow to our present conceptions regarding manifestations and treatment of thyroid disease. In connection with the first case Dr Levine observed that although hyperthyroidism and rheumatic heart disease are often associated, rheumatic fever is not common in myxedema. He raised the question whether the observation had any significance. Dr Means stated that the infrequency of rheumatic heart disease in myxedema is explained by the fact that myxedema itself is not a common disease. He then discussed the first case presented in some detail and cast considerable doubt on the diagnosis of thyrocardiac disease. He believed it unlikely that a thyrocardiac with gross anasarca would have lost all edema on digitalis alone. He stated that the heart in this patient was larger than any he had ever seen in thyrotoxicosis. He expressed the opinion that a thyrotoxic heart does not occur unless a patient already has heart disease of some other sort.

The first speaker of the evening was Dr William T. Salter who gave a clear and concise discussion of the 'Chemistry of the Thyroid Hormone'. The thyroid gland was described as a "trap" for the iodine taken into the body. It shows an increased iodine content within five minutes after the ingestion of potassium iodide and a considerable part of the iodine intake can be recovered from the thyroid the next day. The so-called colloid contains about 90 per cent of the gland's iodine. The remaining 10 per cent contained in the supporting framework is known to be inactive. The iodine of the colloid forms a part of thyroglobulin, a complex protein molecule containing thyroxine and diiodotyrosine. The latter often accounts for two-thirds of the iodine present in the colloid, while thyroxine is responsible for only one-third.

Dr Salter then cited evidence both from animal experiments and from observations on man made by Drs J. H. Means and Jacob Lerman to show that, if not actually a hormone in itself, diiodotyrosine plays an important part in the active principle of the thyroid gland. Thyroxine itself is rather insoluble near the neutral point and oral administration is known to be very unreliable. Dried thyroid given orally, however, is very efficient as is

thyroxine injected intravenously. A polypeptide obtained by enzyme action (trypsin) on thyroglobulin is effective both orally and parenterally. With pepsin, thyroglobulin is split into peptones containing thyroxine and diiodo-tyrosine, respectively. The fraction containing the latter is inactive. Administration of the two together in thyroglobulin combination, however, is far more effective than the thyroxine fraction alone. Thus, the activity of thyroid material is best judged, as Dr Reid Hunt suggested years ago, by its total content of iodine and not by its thyroxine content.

The next speaker, Dr S. Hertz, recounted the results of his work done at the Massachusetts General Hospital in collaboration with Dr Alfred Krane in a report entitled "The Effect of Anterior Lobe Hormones on Thyroid and Parathyroid." Extracts from the urine of pregnancy were found to have no effect on the thyroid in rabbits. Injections of acid and alkaline extracts of the anterior lobe of the pituitary gland, however, were followed within twenty-four hours by a conspicuous hyperplasia. Continued injections caused disappearance of the colloid so that the histological picture closely resembled that of marked Graves' Disease. Long continued injections of the hormone, however, led to involutional and atrophic changes in the thyroid. Other workers (Evans and Szarka) have shown in rats that injections of pituitary extract lead at first to an increased oxygen consumption followed by a fall after prolonged administration. It has been proved that the extract does not act directly to change the oxygen consumption but indirectly through its effect on the thyroid. The histological sequence described was adduced as an explanation of the metabolic data and the clinical application of the method of pituitary overtreatment for thyroid exhaustion was raised as a rational possibility in the treatment of Graves' Disease.

Dr Hertz then described the changes produced in the parathyroids by injections of the anterior lobe extracts. There is marked hyperplasia of the glands with the appearance of mitotic figures in histological sections. Rabbits treated with sterile unheated anterior lobe extract developed marked atonia which failed to appear when heated extract was used. No exhaustion phenomena have been found as yet in the parathyroids as in the thyroid after continued treatment.

The next report was presented by Dr J. Lerman, who discussed 'Total and Thyroxine Iodine in Relation to Dosage of Thyroid'. He observed that in the treatment of thyroid insufficiency there is no substitute better than desiccated whole thyroid gland. Difficulties arise, however, in standardization of the various commercial preparations. Six preparations from four well known commercial houses were studied in various combinations on hypothyroid patients and their potency judged by their effect on the basal metabolic rate. The following dosages of the different products when admin-

sicians, psychologists, social workers, or others are eligible Membership in the Society is not a requisite

Writers who have once received an Award are not again eligible Seasoned writers, senior physicians, or heads of departments in which there are junior workers, while not inevitably excluded, will not generally be regarded as eligible for the Awards

The work on which the papers are based should preferably have been done in New England or by workers now living in New England

The papers will be examined by a Committee of three members who are accustomed to reviewing papers, and by the Executive Committee of the Society They will be judged on the basis of their scientific quality

Copies of articles or marked copies of journals in which the articles appeared should be sent before February 1, 1934, to the Secretary of the Society

Superintendents of institutions, public or private, for the care of mental patients in New England are requested to post this notice and to send to the Secretary a list of such papers published by the members of his staff as he thinks entitled to be considered for the Awards

HARLAN L. PAINE, M.D., *Secretary*

North Grafton, Mass

RADIO HEALTH MESSAGES

JANUARY FEBRUARY MARCH, 1934

Sponsorship Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health

Courtesy WBZ Fridays, 4 30 P.M

Jan

- 12 Prevention Pays A Premium
- 19 Hypertension
- 26 The Common Cold

Feb

- 2 What A Parent Should Know About Measles
- 9 Milk
- 16 Stomach Trouble
- 23 Lumps in the Neck

March

- 2 Age and Cancer
- 9 Some Problems of Epilepsy
- 16 Fractures
- 23 How to Keep the Well Child Well
- 30 Résumé of the Year's Work

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health Fridays 4 40 P.M

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health Courtesy WEEI Fridays, 5 00 P.M

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House Boston

SPECIAL

Beginning Friday, January 19, the State House Broadcasts will be discontinued and in their place will be substituted Ten Minute Health Reviews

Sponsored by the Massachusetts Department of Public Health Assisted by Miss Violette Babcock, Violinist, and Mr G Lambert Roscoe, Pianist and Organist

Courtesy WEEI Fridays, 1 15 P.M

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health, Blended with Classical Music

After hearing this new program we would appreciate your comments

REPORT AND NOTICES OF MEETINGS

THE HARVARD MEDICAL SOCIETY

The Harvard Medical Society met in the amphitheatre of the Peter Bent Brigham Hospital on Tuesday, December 12, at 8 P.M Dr David Cheever was chairman of the meeting The subject for the evening was 'The Thyroid Gland in Health and Disease' This was introduced by the presentation of two cases illustrating different aspects of thyroid disease

The first case was that of a forty eight year old woman who at the age of twenty four had had an attack of pain in both knees associated with swelling, redness, and tenderness Ten years ago she developed progressive swelling of the neck which improved on treatment with iodine Three years ago she showed dyspnea, swelling of the ankles, and palpitation More recently she manifested abdominal distention and, shortly before entering the hospital, she became orthopneic Lately, although her appetite has been voracious, she has lost considerable weight The physical examination disclosed marked venous congestion of neck and upper extremities The right lobe of the thyroid was greatly enlarged and displaced the sternocleidomastoid anteriorly and to the right but there was no fixation. Systolic and diastolic bruits were heard over the thyroid The heart was enlarged to the anterior axillary line An irregular rhythm, pulse deficit, and rough diastolic murmur were noted An edema extended up to the flanks The basal metabolic rate has varied between +55 and +34 Administration of digitals produced marked improvement with disappearance of edema. Iodine treatment has now been instituted

The second case was that of a thirty five year old woman who developed swelling in the neck and nervousness a year or two after taking a position as a telephone operator at the age of seventeen Her symptoms progressed and at the age of twenty four she was admitted on the Surgical Service at the Brigham Hospital with palpitation, nervousness, sweating, and diarrhea. Her hair was gray and

Dr Morse's authority to speak on this subject is well known. He is returning from Florida to present this program which deserves a large attendance

Council meeting at 6 P M, Round Table Dinner at 6 30

All members of the medical profession are cordially invited to attend and to participate in the discussion

ARTHUR H. RING, M.D., *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, January 16, at 8 15 o'clock.

PROGRAM

Presentation of Cases

"A Trip to the East Coast of Greenland." By Dr W G Smillie with motion pictures

JOHN HOMANS, M.D., *Secretary*

BOSTON MEDICAL HISTORY CLUB

John Ware Hall 8 Fenway
Monday, January 15, at 8.15 P.M.

A Trip Through Italy in Search of Medical Manuscripts Dr Henry Sigerist, Professor of the History of Medicine and Director of the Institute for the History of Medicine, Johns Hopkins University

Your attention is called to the free course on Medical Bibliography now being given by the Boston Medical Library The lectures will be held on January 19, 23 30, February 6 and February 13 For further information, apply at the Library

JAMES F BALLARD, *Secretary*

BOSTON MEDICAL LIBRARY

ANNUAL MEETING

The Annual Meeting of the Library will be held on Tuesday evening, January 16th, at the Library, 8 The Fenway, at 8 15 o'clock in Sprague Hall

Following the business meeting Dr Fred B Lund will give a talk entitled 'Galen's Comments on the Game of Ball'

Some Responses of the Body to High Temperature Dr Arlie V. Bock. Illustrated by Stereopticon.

Light refreshments after the meeting

HORACE BINNEY M.D. *Secretary*

MASSACHUSETTS MEMORIAL HOSPITALS

The monthly meeting of the Surgical Section will be held in the Trustees Room on Friday January 12, at 12 noon.

Dr Kenneth K. Day will present a paper on 'Low Back Pain.'

RALPH C WIGGIN, *Secretary*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

January 11—Massachusetts General Hospital Staff Clinical Meeting at 8 15 P.M. in the Moselev Memorial Building

January 12—William Harvey Society will meet at 8 00 P.M. in the auditorium of the Beth Israel Hospital, Boston

January 12—Massachusetts Memorial Hospitals See notice elsewhere on this page

January 15—Boston Medical History Club See notice elsewhere on this page

January 15, 16, and 17—American Conference on Birth Control will be held at the Mayflower Hotel, Washington D. C.

January 16—Harvard Medical Society See notice elsewhere on this page

January 16—South End Medical Club will meet at 12 noon at the office of the Boston Tuberculosis Association, 554 Columbus Avenue Boston

January 16—Boston Medical Library See notice elsewhere on this page

January 17—New England Physical Therapy Society See page 114

January 18—Boston City Hospital Staff Clinical Meeting See page 114

January 18—New England Hospital for Women and Children. See page 114

February 7—Annual dinner of the Tufts College Medical School Alumni Association at the Boston City Club 6 30 P.M.

February 12—House Officers Association of the Boston City Hospital. Subject 'Forensic Psychiatry' Speakers Dr A. Warren Stearns and Dr Abraham Myerson.

February 16 and 17—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club Boston. For details write Dr A. G. Engelbach Massachusetts General Hospital Boston.

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnitz. General Secretary Dr H. E. Walther, Gloriastrasse 14 Zurich

September 3 6—American Public Health Association. See page 114

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association 450 Seventh Avenue, New York, N. Y.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

February 7—Council Meeting Boston.

Wednesday March 7—Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker Dr Frank H. Laher Boston. Subject to be announced. Film Electrocardiogram

Wednesday April 4—Essex Sanatorium Middleton. Clinic 5 P.M. Dinner 7 P.M. Speakers Dr Elliott P. Joslin and Dr Howard F. Root, Boston. Subject Tuberculosis Complicating Diabetes.

Thursday, May 3—Censors Meeting at Salem Hospital, 3 30 P.M.

Tuesday May 8—Annual Meeting Salem Country Club Forrest Street, Peabody Dinner at 7 Speaker to be announced. Subject to be announced

RALPH E. STONE M.D. *Secretary*

221 Cabot Street, Beverly Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE M.D. *Secretary*

Sunderland, Mass.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place in March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D. *Secretary*

76 Church Street, Winchester Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meetings will be held on January 31 and April 25
T. A. STAMAS M.D. *Secretary*
226 Central Street, Lowell Mass

istered orally were found equivalent to one-third milligram of thyroxin given intravenously

Armour	15 grains
Lederle	15 grains
Parke Davis	10 grains
Burroughs and Wellcome	50 grains

The above difference between the various thyroid products has to be borne in mind in the treatment of myxedema or cretinism. Correlating the potency of the substances with their iodine content, Dr Lerman showed that total iodine rather than thyroxin iodine is the important factor. Work in other clinics has shown that in normal patients and animals thyroxin is more efficient than desiccated thyroid according to iodine content. Since these experiments were done in normal patients and animals, however, they are probably not applicable to the human being with myxedema.

The last speaker, Dr James H Means, described "Some Atypical Clinical Pictures of Thyrotoxicosis." He declared that, although a typical case of thyrotoxicosis is the simplest clinical diagnosis that can be made, in some cases there may be one predominant symptom which masks the rest of the picture and leads the physician astray. Moreover the symptoms in hyperthyroidism vary considerably. They are different in men and women, the former sometimes having almost no complaints. In youth the nervous symptoms are the more prominent, whereas, in older people the more important symptoms are referable to the cardiovascular system. In elderly patients the classical fine tremor is often changed to a coarse one. Dr Means called attention to the fact that thyrotoxicosis may occur in childhood with a normal basal metabolic rate which he illustrated by citing a misdiagnosed case. He then reviewed a case in which there was so much muscular atrophy, atonia, and fibrillary twitching that a diagnosis of progressive muscular atrophy was made. The basal metabolic rate, however, was +58 and there was a typical improvement with potassium iodide treatment. In this case, the prominent myasthenia had masked the underlying picture of thyrotoxicosis. Another patient had gastro-intestinal symptoms to so marked a degree that diagnoses of gall bladder disease, ulcer, malignancy, and cirrhosis were made. The basal metabolic rate was +58. Marked improvement followed subtotal thyroidectomy. Still another case cited was that of a sixty year old bachelor with dyspnea, cough, edema, smooth tongue, anemia, and achlorhydria. There was a question of jaundice in the patient's history. The diagnosis evoked considerable debate but a typical response was shown to potassium iodide, and preparation is now being made for subtotal thyroidectomy. In closing, Dr Means emphasized the importance of the diagnostic use of potassium iodide in cases where the diagnosis was in doubt.

After the papers had been discussed by Drs Cheever, Fitz, and Aub, the meeting was adjourned by Dr Cheever.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinico-pathological conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, on Thursday, January 18, at 8 P M. The following cases will be reported: Hypertension with Fibrillation, Carcinoma of the Gastro-Intestinal Tract, Pyloric Stenosis.

In February and March the clinical conferences will be held in conjunction with the staff meetings on the first Thursday evening of each month beginning at 7:30.

ALICE H BIGELOW, M D, *Secretary*

BOSTON CITY HOSPITAL

STAFF CLINICAL MEETING

Thursday, January 18, 1934, at 8:15 P M
Thorndike Amphitheatre

- 1 Nutritional and Infectious Bone Diseases Dr Albert M Moloney
- 2 Pre- and Post Operative Radiation in Breast Carcinoma. Dr Frederick W O'Brien
- 3 Colonic Lesions Including Amoebic Dysentery Dr Max Ritvo
- 4 Interpretation of Cardiac Displacements Dr Paul F Butler

COMMITTEE ON HOSPITAL CLINICS

AMERICAN PUBLIC HEALTH ASSOCIATION

The American Public Health Association announces that its Sixty-third Annual Meeting will be held in Pasadena, California, September 3-6, 1934. The Western Branch of the American Public Health Association, with a membership of more than 1,200 from eleven western states, will hold its Fifth Annual Meeting at the same time.

Dr J D Dunshee, Health Officer of Pasadena, has been appointed Chairman of the Local Committee on Arrangements. He will be assisted by Dr John L Pomeroy, President, and Dr W P Shepard, Secretary of the Western Branch, and other prominent public health authorities on the west coast.

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The regular meeting of the New England Physical Therapy Society will be held in the Banquet Hall of the Hotel Victoria, 271 Dartmouth Street, Boston, at eight o'clock on the evening of January 17, 1934.

This meeting will be conducted by Dr Frederick H Morse.

PROGRAM

Threatened Colon Malignancy Frederick H Morse M D Boston.

Discussion will be opened by Dr William G Curtis.

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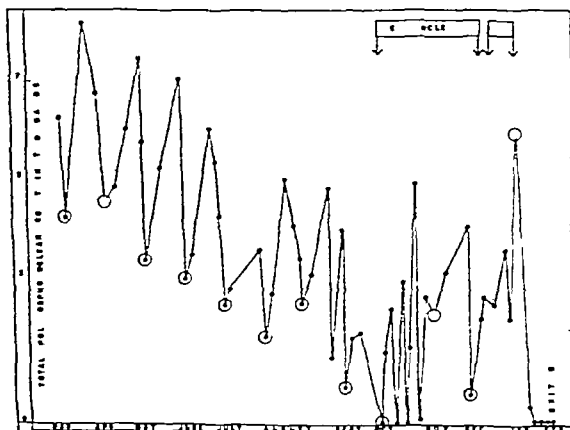
NUMBER 4

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AGRANULOCYTIC ANGINA ASSOCIATED WITH THE MENSTRUAL CYCLE*

BY HENRY JACKSON, JR., M.D.,† AND DUDLEY MERRILL, M.D.† WITH THE ASSISTANCE OF MARION DUANE

THE essential cause of the disease entity known as agranulocytic angina is still unknown. The acute disease is so fulminant that little opportunity is afforded for accurate clinical investigation during the attack. The chronic relapsing cases may be studied more carefully and over a period of time. One most unusual case of this sort was reported by Rutledge, Hansen-Prüss and Thayer in 1930¹, and has only recently been further studied by W. P. Thompson. The results of this latter investigation appear in this number of this *Journal*. The case reported below is of interest in view of Thompson's findings.



The relation of the total polymorphonuclear count to the menstrual cycle in a patient with agranulocytic angina (relapsing). Onset of menstruation indicated by circles around dots. A. S. indicates treatment with antuitrin S.

Mrs. A., a widowed American housewife, 30 years old, was first seen by us on December 17, 1931. She was known to have had four typical attacks of agranulocytic angina in the two preceding years, each attack being characterized by extreme leukopenia and granulopenia and by ulcerations of the mucous membranes of the mouth.

On December 17, 1931, she had another relapse. An account of this and the subsequent attack has already been published.²

It had been noted by the patient herself early in the course of her illness that all her relapses were initiated very precisely on the first day of her menstrual period and in March, 1932, a study of the

peripheral blood picture in relation to the menstrual cycle was begun. A simplified and condensed chart recording the changes found is presented.

It is to be noted that with the onset of each menstrual period the total number of polymorphonuclear neutrophils fell precipitantly only to rise again rather rapidly to approximately the previous level. This finding has already been referred to.² With each catamenia from March, 1932 to January 1933 the same phenomenon was observed. At no time, however, was the patient acutely ill until on October 22, 1932, when menstruation started and an actual attack of agranulocytic angina was initiated. Both clinical and hematological improvement followed Pentnucleotide (N.N.R.) therapy, but a marked and refractory upper respiratory infection set in. To this infection can be attributed we believe the fluctuation of the peripheral white blood cell counts during the succeeding weeks when she was under rather intensive Pentnucleotide therapy.

An extreme drop in total polymorphonuclear neutrophils occurred again on November 17, 1932, the date on which her next period was expected. This, however, for no known reason, was delayed five days and when menstruation actually began no drop in polymorphonuclear neutrophils occurred.

Again it is to be particularly noted, as the chart shows, that with some regularity the total polymorphonuclear neutrophils fell to a lower level with each successive menstrual period and their subsequent recovery was to a less satisfactory height. The exact significance of this is not clear but it may be compared with a similar decline in the red cell level in pernicious anemia before the days of liver therapy. The course taken by the leukocytes may indicate, however, that two factors are at work, one slowly progressive and fundamental, the other related to the menstrual cycle and periodically aggravating the first. This gradual fall in general polymorphonuclear level led us to believe that unless some remedy was found that would prevent the fall the eventual outcome would be fatal in this particular case. For ten days prior to the catamenia due on December 21, 1932, she was given daily 10 cc of Pentnucleotide intramuscularly. The number of polymorphonuclear neutrophils under this treatment rose from 2200 to 4500 per c.mm. but with the onset of menstruation fell suddenly to 500 per c.mm. Thus while the general level of the white blood cells had apparently been raised by Pentnucleotide therapy and the tendency to fall lower with each succeeding catamenia had been lessened, yet the fall was not completely prevented.

In view of the apparent relationship between the menstrual cycle and the number of white blood cells it was decided to try Antuitrin S (Parke Davis and Company) prior to the next menstrual period and 2 cc. of this material were administered daily for ten days prior to the catamenia of January 1933. For the first time in eleven months there was a sharp rise in total polymorphonuclear neutrophils the first day of the menstruation and they reached a level which was higher than at any time during the preceding seven months. Fourteen days later the pa-

*From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and The Department of Medicine, Harvard University.

†Jackson—Assistant Professor of Medicine, Harvard Medical School. Merrill—Assistant in Medicine, Harvard Medical School. Duane—Blood Technician, Thorndike Memorial Laboratory, Boston City Hospital. For records and addresses of authors see "This Week's Issue," page 2-5.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

February 20—Meeting at the Metropolitan State Hospital Waltham, 5 P M

NORFOLK DISTRICT MEDICAL SOCIETY

January 28—Tentatively Roxbury Masonic Temple, 8 P M Continuance of Symposium on Diseases of the Blood Dr Dameshek and Dr Straus

February 27—Place, time subject and speaker to be announced

March 27—Place and time to be announced Dr Edward A. Edwards and Dr Henry H. Faxon Symposium on the Treatment of Varicose Veins

May—Annual Meeting Place, time and program to be announced

FRANK S CRUICKSHANK, M.D Secretary

1695 Beacon Street, Brookline, Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

February 1—12 noon at Norfolk County Hospital Stated Meeting Speaker Dr Sara Jordan Subject Stomach Ulcers

March 1—12 noon at Quincy City Hospital Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital Speaker Dr Elliott P Joslin Subject Diabetes

May 3—12 noon at Norfolk County Hospital Annual Meeting Election of Officers

N R. PILLSBURY M.D Secretary

Norfolk County Hospital South Braintree Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

January 31—General Meeting in association with the Boston Medical Library and the Trudeau Society Speaker Dr Lawrason Brown of Saranac Lake

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program titles and speakers to be announced

The Medical Profession is cordially invited to attend all of these meetings

JAMES H MEANS, M.D Vice-President.

GEORGE P REYNOLDS M.D Secretary
311 Beacon Street, Boston Mass

ALEXANDER S BEGG M.D,
Boston Medical Library

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester Mass

March 14—Dinner and scientific program at the Memorial Hospital Worcester, Mass

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C MILLER, M.D Secretary

27 Elm Street, Worcester, Mass

BOOK REVIEWS

A Life Against Death By KENELM WINSLOW Published by Lowman & Hanford Company 292 Pages Price \$3 00

To the medical reader, the life story of another physician must be dull indeed if it does not call forth memories full of interest. Dr Winslow's autobiography is far from dull. It is a rambling, disjointed narrative written entirely from the objective point of view. A series of events is strung along on a thin thread of continuity, one learns what the author did, but never why he did it.

Dr Winslow's life was not unusual. Born and reared in eastern Massachusetts, he attended the Harvard Medical School, interned at the Massachusetts General Hospital and practiced for a time in

Watertown. His descriptions of people and places are vivid, and his tales of yachting adventures are blood-curdling.

After ten years of practice in Watertown, he moved to Seattle. One fails to get a clear picture of his career in that city, in place of that, the reader is told of several amusing or sensational episodes which occurred in Dr Winslow's practice. The book closes with an account of the author's service in the United States Army, which was a futile and desolate period, as Dr Winslow himself realizes.

For one who has himself known the institutions and hospitals described in "A Life Against Death," the book makes interesting reading. As a record of a period, it is not without value. A bit more depth, a little more peering beneath the surface of things, would have given it a stability which is now lacking. To use a simile which the author would be sure to understand, we would say that he has hoisted too many light sails, and has not sufficient lead on his keel.

Starling's Principles of Human Physiology Sixth Edition Edited and revised by C Lovatt Evans with the assistance of H Hartridge Published by Lea & Febiger, Philadelphia 1122 Pages Price \$8 75

Physiology has advanced considerably within the last few years. New physical and chemical methods have been successfully applied. The number of quantitative studies has increased, producing a more accurate appreciation of laws and relations. Yet many facts have been acquired which stand apparently isolated, without any clear correlation with the general knowledge of physiological organization. As a consequence, specialization within the physiological science is more and more apparent. The task of preparing an adequate textbook of physiology is therefore increasingly difficult for a single person or a small number of authors.

In view of these facts, the new edition of Starling's classic deserves warm praise. With minor exceptions the book is as up to date as can be expected. The relative development of the different chapters is in general adequate. Most of the fundamental data and inferences are included and clearly and interestingly presented. The ground covered and the details offered satisfy the needs of medical students. The addition of a short, selected bibliography is especially praiseworthy, the student will find in it a good guide for indispensable further reading.

The first part of the volume, a short summary of some subjects of general physiology, is probably superfluous in a text of human physiology. The functions of autonomic nerves, of smooth muscle and of endocrine glands are perhaps not sufficiently emphasized. Notwithstanding these possible flaws, the book possesses a high pedagogical value and is among the best of modern textbooks of physiology.

agranulocytosis were observed in six of this group of eighteen cases and each recurrence in each individual appeared coincident with catamenia

Two young women who had recovered from previous attacks of typical agranulocytic angina were followed, with frequent blood cell counts, through a menstrual period. The white blood cell counts and percentage of neutrophils are recorded in table 1. It appears that in these two individuals a definite neutropenia occurred four or five days before the onset of catamenia, this neutropenia was without subjective symptoms of any kind.

Additional information was obtained from study of a young male patient with cyclic agranulocytosis. This individual, who is now twenty-five years old, has been carefully followed throughout his entire existence. He has been seen by many men, in many clinics, and the almost unbelievable regularity of the neutropenic episodes has already been the subject of two communications. His early history is available in the report of his pediatrician.¹ The subsequent course and studies have been brought up to 1929 by Rutledge, Hansen-Prüss and Thayer.² Since 1929 he has been under the care of Drs. Garnett Cheney and Arthur Bloomfield of San Francisco who referred the patient to Dr. Norton S. Brown of New York with data on the 1929-1933 period.

It is therefore known that from the age of two and a half months to the present time the patient has had a cyclic neutropenia, that each cycle is identical with previous episodes, and that the complete cycle occupies a total duration of twenty-one days. A detailed clinical and hematological report of these cycles is available in the 1930 report.²

Since 1930 there has been no change in the periodicity of the attacks, they continue to occur at three week intervals, and it is still possible, by doing a white blood cell count on any given day to predict, with startling accuracy, that an identical count will be found twenty-one days later.

Two additional observations of interest have been made by Dr. Cheney.⁴ First, the patient has developed, within the last two years, a true diabetes insipidus that responds promptly to injections of posterior pituitary extract. Secondly, that injection of Pentnucleotide (N.N.R.) is capable of partially aborting the next scheduled episode. It now seems quite clear that in this patient, the fall in granulocytes definitely precedes the onset of fever, buccal necrosis and other symptoms, and that if the extreme neutropenia of an impending attack is prevented with nucleotide, no subjective symptoms whatever will occur. This is excellent evidence that the primary disturbance lies in the control of granulocyte production.

The regularity of the attacks, the presence of

diabetes insipidus together with the obvious and previously noted² physical and emotional evidence of endocrine imbalance suggested that a study of hormone excretion in relation to the white cell counts might be of interest. The patient was, therefore, admitted for study under the direction of Drs. Raphael Kurzrok and Norton S. Brown to whom I am greatly indebted.

At the time of admission the patient was just starting the phase of progressive neutropenia, the height of the attack being still a week ahead. It was decided to observe the attack without instituting nucleotide therapy and to follow the course with daily blood cell counts, daily determinations of gonadotropic hormone (prolan) in the urine and frequent estimations of the urinary excretion of female sex hormone. In addition, many basal metabolic rate determinations were done, all of which fell within normal limits. He was given a normal diet, was allowed to be up and about, the fluid intake and output were measured together with the usual routine hospital procedures.

TABLE 2

Date 1933	Female Sex Hormone in Urine	Prolan in Urine	White Blood Cells	Per Cent of Neutro- philes
Rat Units				
May				
23	34-68	—	3 000	42
24		0	3 300	22
25	?	0	3 700	11
26		0	3,700	12
27	81 162	0	3 000	12
28	72	— 0	2,800	3
29	0	Slight	3 200	5
30	0	Slight	2 200	1
31	—	—	3,300	2
June				
1	—	—	3 800	3
2	76	Slight	4,700	3
3		0	4 300	3
4	92	0	3,600	6
5		0	4 300	6
6	116	0	5 500	21
7		0	6 200	
8		0	5 400	54*
9			6 800	
10				
11				
12				
13				
14				
15				

Operation

The total white blood cell count and percentage of neutrophils in relation to the urinary excretion of female sex hormone and prolan during the neutropenic phase of a case of cyclic agranulocytosis

The more significant data are shown in table 2 and are plotted in the chart. It is regrettable that a more complete study was not possible, but the patient has never been very cooperative.^{1, 2} The absence of female sex hormone

tient caught a severe "cold in the head" and after a dietary indiscretion had diarrhea, nausea and vomiting. Her white blood cells at that time were 3000 per c mm with 28 per cent polymorphonuclear neutrophils. The white blood cell count and percentage of polymorphonuclear neutrophils gradually fell. The upper respiratory infection progressed and a severe cellulitis of the buttock developed. All medication other than symptomatic was refused. The patient died February 16, 1933 at approximately the time the next catamenia should have appeared.

No definite conclusions have been drawn from this case. It would appear, however, that at least in some instances of relapsing agranulocytic angina there is a definite temporal relation between the menstrual cycle and the intensity of the leukopenia. That the relationship is not always constant is attested to by such cases as have been described by Doan³, but we have been increasingly impressed by the number of cases of agranulocytic angina in which the attacks

occur at or about the time of the menstrual period and it should be noted that over 80 per cent of the cases are in females. Thompson's observations appear to indicate that a similar mechanism may be at work when the disease occurs in males.

At the time Mrs. A. was being studied no determinations were made of the sex hormones, largely because of the inadequate methods available at the time. Such studies are, however, now being made on other cases with the hope that they may help to elucidate the nature of this baffling condition.

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OBSERVATIONS ON THE POSSIBLE RELATION BETWEEN AGRANULOCYTOSIS AND MENSTRUATION WITH FURTHER STUDIES ON A CASE OF CYCLIC NEUTROPENIA*

BY W. P. THOMPSON, M. D.†

IT now seems fairly certain that, in a vast majority of cases of agranulocytosis, the primary disturbance takes place in the bone marrow, that cessation of myeloid growth at the myelocytic level precedes, rather than follows, other evidence of this disease.

It is, therefore, of interest to inquire into possible factors that might be in any way associated with this disturbance. With this in view, patients with agranulocytosis have been questioned at length with respect to their habits, diet, contact with drugs or poisons, or any recent change of any kind in their general mode of living. No common factor has been found.

However, a recent review of the forty cases of agranulocytosis that have been studied in this clinic suggested a possible temporal correlation between the onset of the neutropenia and the onset of menstruation.

The predominance of the condition in women is known, and of our forty cases only five were males.

Of the thirty-five women with agranulocytosis, twenty-five were less than forty-five years old, that is, within the menstrual age. In three of these twenty-five cases the histories are incomplete. Two patients had had a previous artificial menopause and in two the neutropenia appeared with endometritis following abortion. In seventeen of the remaining eighteen cases the onset of the subjective symptoms of agranulocytosis

occurred within one or two days of the onset of the regular menstrual period and all of these

TABLE 1

Patient No. 1			Patient No. 2		
Date 1933	White Blood Cells	Per Cent Neutro- philes	Date 1933	White Blood Cells	Per Cent Neutro- philes
July			July		
6	3,600	52	10	7,800	65
7	3,500	35	12	7,300	69
8	3,900	29	13	7,800	63
10	4,700	53	17	3,700	36
11	4,000	47	18	3,400	44
12	5,700*	38*	19	4,700	46
13	6,000	43	20	5,700	57
14	6,500	57	21	5,100	45
15	10,200	43	22	7,200	58
17	6,700	52	24	7,100	57
18	5,900	43	26	9,700	61
19	5,300	61	27	8,600	57
20	4,100	56	29	6,600	76
21	6,300	48	31	1,500	28
24	5,300	62			
			Aug		
			1	2,700	22
			2	3,300	25
			4	5,800*	54*
			5	5,000	61
			7	8,000	66

*Onset of Catamenia.

The total white blood cell count and percentage of polymorphonuclear neutrophils in two patients shortly before and during a menstrual period who had at this time no symptoms but who had previously had attacks of agranulocytic angina.

seventeen patients were menstruating at the time of admission to the hospital.

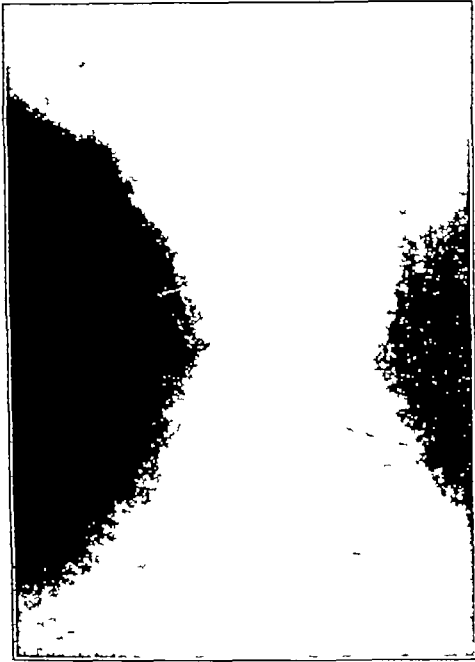
In addition, one or more recurrences of the

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†Thompson—Assistant Physician, Presbyterian Hospital, New York City. For record and address of author see "This Week's Issue," page 2-5.

sition until the recent introduction of the vertical view of the hip joint by Drs George and Leonard of Boston. This work is a distinct contribution to hip joint surgery and in a convincing manner exposes our failures of the past and gives us a reasonably sure test for any manipulative method employed for reduction of intracapsular fractures of the neck of the femur or separation of femoral epiphyses. It is an accepted fact that the displacement of the epiphysis takes place at the diaphyseal side of the epiphyseal line. The leg is in extreme internal rotation and adduction, posterior to the plane of

knee, which is flexed, the lower leg lying against the body of the operator. Traction against resistance by an assistant holding the pelvis is then applied with the hip flexed. The leg is next carried into adduction and by a process of circumduction from this position, namely lifting the upper leg with traction and rotating in a circle from adduction to extreme abduction, the leg may then be readily internally rotated and thus engage the slipped epiphysis. It will be readily noted that only with the leg in extreme abduction is it impossible to internally rotate the femur. At this point the x-ray check-up should



FIGURES 1 and 2 X rays taken immediately after the injury. Note the anterior posterior and lateral views showing clearly the neck, anterior to the slipped epiphysis.

the other leg, when the separation takes place. There then occurs a simple act of torsion in which there is leverage of the epiphysis against the inferior aspect of the acetabulum, the pelvis being twisted against this resistance in such a way as to cause the displacement. The position of the neck of the femur after the displacement has occurred is always anterior to the epiphysis, thus forcing the leg into strong eversion or external rotation. The mechanics are precisely the same as occur in intracapsular fractures of the neck of the femur, the displacement of the fragments, however, being caused by an actual impact of the hip against the ground or floor.

Treatment. It is the writer's opinion that reduction of epiphyses should be done as soon after the displacement as is possible. The diagnosis should always be made by anterior-posterior and vertical views. Under a suitable anesthesia, the operator flexes the knee with the femur still in external rotation. The leg is raised with the arm of the operator under the

be made from both views. The leg is then brought down with the knee fully extended so that the medial aspect of the foot lies flat and abduction of the leg to the extent of forty-five to fifty degrees maintained. Plaster boots are then applied to the lower leg, being carried up to the tubercle of the tibia on both legs. A stick is then applied between the two plaster boots incorporating the ends of the stick in plaster.

HISTORY OF CASE. G. B. G. Aged 12. Mother states boy has always been overweight for his age. He never has had any previous injuries to this hip. About two years ago he had scarlet fever and had some pain at that time in the hip joints as a complication but never any sign of infection.

Present symptoms. About forty-eight hours ago patient fell while roller skating striking on left side. He was seen by Dr. Stratton of Melrose who sent him to the Hospital and x-rays were taken. Figures 1 and 2.

Examination. This boy borders on the hypopituitary type. The left leg is held in marked eversion and external rotation, typical position of either intra

on May 25th and May 26th was checked, but a delay had occurred in the delivery of the specimen. No determination could be made on May 31st and June 1st. The figures should otherwise be correct up to June 9th when the patient was circumcised, at his request. Following this

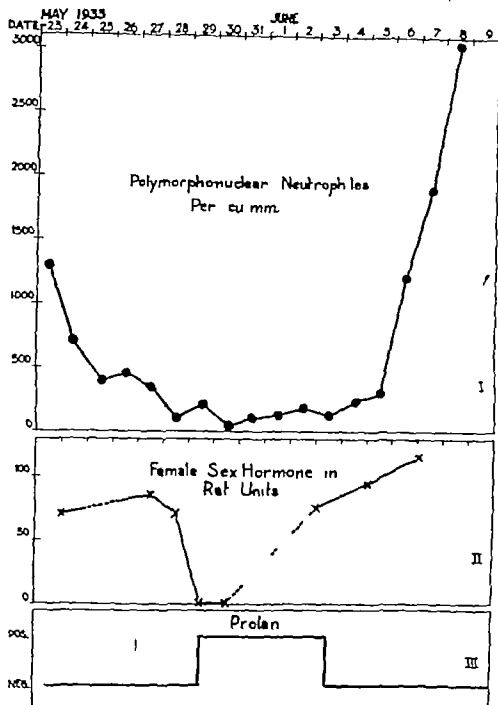


CHART I. Graphic representation of figures obtained from patient with cyclic neutropenia.

operation considerable difficulty was experienced and, as another attack of neutropenia was on its way, it was decided to conclude the observations and start Pentnucleotide.

The data do seem to show, however, several interesting points.

In the first place, this man excretes at times, an enormous amount of female sex hormone.

In the second place, there is an apparent fluctuation in the ovarian hormone that closely follows figures obtained by Frank and Goldberger³ for the fluctuation of these hormones in the blood of normal menstruating women. Catamenia apparently takes place in normal women immediately after a drop in female sex hormone excretion and coincides with the appearance in

the urine of small amounts of gonadotropic hormone (prolan).

It seems likely therefore, that this male patient is experiencing cyclic hormonal fluctuations that are similar to the hormonal menstrual cycles of women.

The curve of the daily number of circulating neutrophilic leucocytes follows rather closely the curve of female sex hormone excretion. And it is of considerable interest that the height of the neutropenic attack should coincide with what might be called his hormonal catamenia.

SUMMARY

1 In seventeen out of eighteen young women with agranulocytic angina, the onset of subjective symptoms occurred within a day or two of the onset of the regular menstrual period and all seventeen were menstruating at the time of admission to the hospital.

2 One or more recurrences of agranulocytosis were observed in six of these eighteen patients and each recurrence in each individual coincided with the onset of catamenia.

3 Two young women, who had had previous attacks of agranulocytic angina were followed through a menstrual period. In both a distinct but transient neutropenia developed, without symptoms, just before the onset of catamenia.

4 The excretion of female sex and gonadotropic hormones was followed during the neutropenic phase of a well-known and previously reported case of cyclic agranulocytosis. The results suggest that neutropenia occurs, in this young man, at the time of hormonal catamenia.

CONCLUSIONS

From these observations, together with the studies of Jackson (published in this same issue), it seems possible that, in some cases of agranulocytosis, a relationship exists between the hormones associated with menstruation and the neutropenic episodes. Further studies on this possible relationship are now being undertaken.

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- 4 Cheney Garnett. Personal communication.

MECHANICS AND REDUCTION OF DISPLACED UPPER FEMORAL EPIPHYSIS

BY JOHN D. ADAMS, M.D.*

THE end results of displaced femoral epiphyses, whether by closed or open method of reduction, have on the whole been rather unsatisfactory. This fact holds true whatever the cause of displacement, viz, trauma, endocrine disturbance or acute infection. The surgeon has been

misled in the x-ray interpretation of his end result. The treatment of the hip joint, representing a very high percentage of joint injuries, has been questionable. It has been the only important anatomical bony structure susceptible to disease and injury that we have not demanded a two plane attack from the x-ray. The operator has never been sure of his anatomical repo-

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sition until the recent introduction of the vertical view of the hip joint by Drs George and Leonard of Boston. This work is a distinct contribution to hip joint surgery and in a convincing manner exposes our failures of the past and gives us a reasonably sure test for any manipulative method employed for reduction of intracapsular fractures of the neck of the femur or separation of femoral epiphyses. It is an accepted fact that the displacement of the epiphysis takes place at the diaphyseal side of the epiphyseal line. The leg is in extreme internal rotation and adduction, posterior to the plane of

knee, which is flexed, the lower leg lying against the body of the operator. Traction against resistance by an assistant holding the pelvis is then applied with the hip flexed. The leg is next carried into adduction and by a process of circumduction from this position, namely lifting the upper leg with traction and rotating in a circle from adduction to extreme abduction, the leg may then be readily internally rotated and thus engage the slipped epiphysis. It will be readily noted that only with the leg in extreme abduction is it impossible to internally rotate the femur. At this point the x-ray check-up should



FIGURES 1 and 2. X rays taken immediately after the injury. Note the anterior posterior and lateral views showing clearly the neck, anterior to the slipped epiphysis.

the other leg, when the separation takes place. There then occurs a simple act of torsion in which there is leverage of the epiphysis against the inferior aspect of the acetabulum, the pelvis being twisted against this resistance in such a way as to cause the displacement. The position of the neck of the femur after the displacement has occurred is always anterior to the epiphysis, thus forcing the leg into strong eversion or external rotation. The mechanics are precisely the same as occur in intracapsular fractures of the neck of the femur, the displacement of the fragments, however, being caused by an actual impact of the hip against the ground or floor.

Treatment. It is the writer's opinion that reduction of epiphyses should be done as soon after the displacement as is possible. The diagnosis should always be made by anterior-posterior and vertical views. Under a suitable anesthesia, the operator flexes the knee with the femur still in external rotation. The leg is raised with the arm of the operator under the

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Present symptoms. About forty-eight hours ago patient fell while roller skating striking on left side. He was seen by Dr. Stratton of Melrose who sent him to the Hospital and x-rays were taken. Figures 1 and 2.

Examination. This boy borders on the hypopituitary type. The left leg is held in marked eversion and external rotation, typical position of either intra-

capsular fracture of the neck of the femur or a slipped epiphysis

Under ether Leg was manipulated as described and in carrying the leg to extreme abduction one could readily rotate the femur internally without the slightest resistance Plaster boots were applied and the leg put up in about forty five degrees of abduction

Postmanipulative x ray check up Figures 3 and 4—note the perfect reposition of the epiphysis as checked by the vertical view Boy was kept in apparatus for ten weeks

Final check up Eight months after injury boy reports stating he has absolutely no pain and no sub

treatment simplifies the nursing care of the patient throughout convalescence With the leg internally rotated and abducted and the knee in full extension it is possible to roll the patient over and care for the skin of the buttocks, also to take frequent x-rays without the complication of a plaster spica The patient may be sat up at an angle of forty-five degrees From the testimony of six cases of intracapsular fractures of the neck of the femur which the writer has treated by this method, one is convinced that from the standpoint of comfort it is a dis-



FIGURES 3 and 4 Representing views taken after the reduction

jective symptoms whatever He cannot cross the left leg so well as he could before the accident but this is steadily improving He cannot tie his shoes so well as he could before but this too is gradually improving

Examination Patient walks without a limp legs measure the same in length abduction and flexion is limited to two-thirds normal patient is able to cross the legs in a sitting position, hyperextension is slightly limited

In the writer's experience of six cases of slipped epiphysis this is the first satisfactory result from either closed or open reduction The writer also feels that had we had the advantage of the vertical view in the past, that many of the cases of intracapsular fractures of the neck of the femur, treated by the Whitman technique would have shown far better end results The plaster boot method was first described by Wilke but in his original description he does not accentuate internal rotation This method of

tinct advantage over other methods of treatment

SUMMARY First—Separation of upper femoral epiphysis should be reduced as soon as possible after the slipping has occurred

Secondly—The above method in the opinion of the writer produces a minimum amount of trauma to this all-important structure

Thirdly—The ability for a frequent and conclusive x-ray check-up by both anterior-posterior and vertical views visualizes the exact position and condition of the bony structure as we have never heretofore been able to accomplish

Fourthly—The comfort of the patient and the ease of hospital care have proved to be a very great factor in the acceptance of this method of treatment

REFERENCE

- 1 Leonard R. D. and George A. W. Cassette with convex curve Am. J. Roentgenol. 28 261 1932

JAUNDICE IN ARTHRITIS ITS ANALGESIC ACTION*

Report of 4 Cases

BY NATHAN SIDEL, M.D.,† AND MAURICE I. ABRAMS, M.D.†

THIS is a report of four patients with infectious (rheumatoid or atrophic) arthritis who experienced striking relief of all joint symptoms with the onset of jaundice. In all cases, the peak of jaundice was reached in several days, after the onset, followed by a steady diminution in the icteric index, a normal level being reached in three to six weeks. In all four cases, joint pain had been constantly present for at least several months and was abruptly terminated with the development of jaundice. In addition to the relief of pain, one patient with swelling, stiffness, and redness of the joints had marked improvement of these signs as well. In no case did any joint pains reappear until after the jaundice had subsided, in one case there has been no recurrence of joint symptoms for over two years, in the other three cases, the joint pains were considerably attenuated when they did recur.

CASE REPORTS

CASE No 1 I. R. a married white male, aged 39 years came to the outpatient department on January 5, 1933 complaining of joint pains of five years duration. His elbows fingers spine hips, knees and hands had all been involved in various degrees. Typhoid inoculations sulphur baths, eradication of all possible foci of infection and energetic treatment from a chiropractor had all failed to afford him any relief. Generalized psoriasis had been present as long as his joint pains and to a slight degree for several months before the onset of arthritis.

Physical examination revealed redness and swelling of the right metacarpal and right proximal interphalangeal joints. There was definite deformity of the fingers of both hands. Generalized psoriasis was present.

Clinical Course Around April 1, 1933 he noted complete freedom of joint pains for the first time in many months. A few days later his skin and sclerae were definitely yellow. He was admitted to the medical ward on April 6, 1933 and remained in the hospital for 24 days. During this period his only symptoms were malaise nausea weakness and vomiting at no time was there any joint discomfort. The redness and swelling of the involved fingers were distinctly lessened. Following his discharge from the hospital he remained free of all joint pains for several weeks, then there was recurrence of pain, but much milder than at any time in the past five years.

Diagnoses Infectious Arthritis (Psoriatic Type)
Infectious Hepatitis (Catarrhal Jaundice)

CASE No 2 E. B. a married white female aged 47 years came to the outpatient department on January 12, 1931 complaining of pains in both hands

fingers, feet elbows and shoulders of three years duration. On February 16, 1931, oxyiodide, two capsules* daily, was prescribed. After two weeks she stopped taking the medicine because of the onset of itching of the palms feet and scalp. Soon thereafter, she noted a diminished appetite nausea and heart burn but her joint pains disappeared completely. On March 26, 1931 she was admitted to the medical ward for treatment of jaundice.

Clinical Course The patient remained in the hospital for 20 days. Her liver which was enlarged to four fingerbreadths below the costal margin, gradually receded until at the time of discharge it was only barely palpable. The icteric index fell from an admission level of 132 to 25 at the time of discharge. Her jaundice gradually lessened until at the time of discharge there was only a slight icteric tint. She was comfortable and free of pain at the time of discharge, and remained so until April 1933, when there was for the first time since her attack of jaundice two years previously, a recurrence of her joint pains. However she noted that her joint pain was much less intense than previous to her attack of jaundice.

Diagnoses Infectious Arthritis
Toxic Hepatitis (Oxyiodide)

CASE No 3 I. L. a married white male aged 38 years entered the ward September 29, 1931 complaining of rapidly progressive jaundice with anorexia of one week's duration. For three months previous to the onset of jaundice he had suffered from severe pains in his knees spine and in all the joints of his upper extremities but these pains disappeared completely when jaundice commenced.

Clinical Course The patient remained in the hospital for 24 days during which time he was fairly comfortable gradually regained his appetite and steadily became less jaundiced. His icteric index on admission was 55 and fell to 12 by the time of discharge. Throughout his hospital stay he was absolutely free of any joint pains. Following the complete disappearance of his jaundice he once again began to suffer from joint pains considerably less severe than formerly.

Diagnoses Infectious Arthritis
Infectious Hepatitis (Catarrhal Jaundice)

CASE No 4 C. L. a white housewife aged 49 years was seen for the first time in the outpatient department on April 14, 1931 complaining of painless jaundice of five weeks duration. Three months previously she had commenced suffering from pain in her left ankle almost constant and severe enough to cause her to take to bed. After a few weeks of this pain, she was given atophan 36 to 48 tablets and then 24 capsules of oxyiodide. Shortly thereafter she noted itching of her entire body and jaundice. At the same time she experienced complete relief of her joint pains.

Clinical Course The patient was admitted to the ward and remained there for approximately three weeks. Throughout this period she was rendered quite uncomfortable by itching of the skin, nausea and intense jaundice but at no time did she have the slightest degree of pain in her left ankle. The jaundice gradually cleared and she was discharged symptom free. Two years later the patient

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For records and addresses of authors see "This Week's Issue" page 25.

*One capsule oxyiodide contains 0.2 Gm. of phenylcinchonine acid.

was enjoying good health and stated that she had had no joint pain since her attack of jaundice
Diagnoses Infectious Arthritis

COMMENT

These four patients have made recent visits to the Arthritic Clinic and each one, without prompting, readily volunteered the information that his joint pains had disappeared "as if by magic" at the first sign of jaundice. The patients' own insistence on this fact, together with the histories of prolonged joint involvement that had withstood certain therapeutic measures, make it likely that the alleviation of joint pain was related to the jaundiced state. The dramatic relief of pain that had tormented Case No. 1 for five years until the onset of jaundice certainly suggests something more than coincidence.

It seemed that a study of the case histories reported in the voluminous literature on cinchophen poisoning would aid in determining whether it had been observed that jaundice had an analgesic effect on joint pain. From this point of view, the case histories in the reports on cinchophen poisoning are indefinite. In most instances, no reference is made to joint pain, in some cases, vague pains are described. However, from the fact that joint pains have not been mentioned as being present, and since in practically all instances cinchophen had been administered for the relief of joint pains, it is reasonable to conclude that once the jaundice of cinchophen poisoning had become manifest, the joint pains disappeared. For when every symptom, such as nausea, gas, distress, and abdominal pain are mentioned, as they frequently are in these cases, it seems fair to conclude that joint pain would also have been reported if it were present.

Of the four cases, two patients had infectious hepatitis (catarrhal jaundice) and two patients had toxic hepatitis. From this it would appear that the jaundice per se and not the exciting cause of the jaundice has afforded relief. This is in harmony with the findings of Hench¹ who has collected about twenty cases of chronic arthritis complicated by various disorders leading to jaundice in which relief of the joint pains has occurred in association with jaundice.

What constituent of the jaundiced state is the effective analgesic agent in arthritis is so far undetermined. An excess in circulating bilirubin, as well as an increased amount of bile salts, is present and which of these two factors is the more significant awaits further investigation. We have so far given bile salts in large doses to several patients with infectious arthritis, and although the results have been gratifying, we hesitate to place undue weight upon them.

SUMMARY

Four patients presenting jaundice in chronic arthritis are reported.

Marked relief of the joint pain occurred suddenly with the onset of jaundice in each case.

The arthritic pain either remained absent or recurred with much lessened severity with the subsidence of the jaundice.

The abnormal factors present in the jaundiced state are being investigated as to their therapeutic effect in infectious arthritis. Bile salts administration in several cases of infectious arthritis has been attended with clinical improvement.

REFERENCE

- 1 Hench P. S. Analgesia accompanying hepatitis and jaundice in cases of chronic arthritis fibrositis and sciatic pain. Proc. Staff Meet. Mayo Clinic. 8:480 1933

THE GEORGE W. GAY LECTURE ON MEDICAL ETHICS*

The Theology of Medicine

BY ROBERT B. OSGOOD, M.D.†

SIR James Barrie has quaintly confessed to the possession of a dual personality. This constant companion was named McConnachie, and whenever Sir James wished to be serious, McConnachie threatened to turn him into a casual, fanciful person, though a very charming one.

I fear there must have been a stern religious ancestor who is responsible for an alter ego of whom I am sometimes conscious. He is, alas, not entertaining like McConnachie, but a sort of Cotton Mather, who when I would be light, trips me into preaching a sermon. It was this Mather

person who insisted upon the title of this discourse. I have attempted to elude him and to squelch him, but have not been entirely successful, and I feel it only fair for you to realize the handicap under which the part of me that is supposed to deliver this lecture has been laboring.

Theology literally means the science of religion and morals. Religion is an attitude, morals to some extent may be codified. The worst of it is that I have a notion that Mather may not have been entirely wrong when he persuaded me that the attitude which physicians assume is as important as the code of ethics under which they practise.

It is fortunate that the founder of these Harvard Lectures on the subject of Medical Ethics,

*Delivered at the Harvard Medical School November 2, 1933.

†Osgood—John B. and Buckminster Brown Professor of Orthopedic Surgery Emeritus Harvard. For record and address see page 295.

which may perhaps be called The Theology of Medicine, should have been not only a priest of Asklepios, but should have exemplified by his life the religion he taught

Dr George W. Gay, born in 1842 and dying in 1931, traveled on that stretch of medical road which emerged from the obscuring woods of ignorance of cellular pathology, biological chemistry and the causes of infection, into the more open country cleared by Virchow, Pasteur, Lister and Roentgen

With a proud ancestral line, humbly born and frugally educated, he struggled against the handicaps that challenged him, shook off the chains that bound him, and strong and free, acquired wisdom and skill in medicine and surgery. As a useful citizen, a beloved physician, a respected and honored colleague, he added prestige to his profession and benignly influenced the medical life of this community. With the modest bearing of really great characters, he served with distinction the Boston City Hospital as chief of its surgical staff and the Massachusetts Medical Society as its president.

Dr Gay's bequest for lectures on Medical Ethics is in complete consonance with his character. I remember him as an able surgeon, an efficient executive, an inspiring teacher. When I think of him, however, I find that it is the gentleness of his nature and his high standards of conduct which have left the deepest impression.

Finances In his letter to the Corporation of Harvard University, Dr Gay expressly requested that the lectures given under his will should be concerned with the finances of the physician as well as with the general topic of Medical Ethics. He desired that both fees and investments should be discussed. In order to conform with his wishes, these subjects will be touched upon at the outset so that we may have done as quickly as possible with the less pleasant matter of the wherewithal and be able to discuss more leisurely the questions of the how-with-all and the why-with-all. This year, for the first time, the comprehensive findings of the Committee on The Costs of Medical Care have put into our possession reliable facts as to where go the three and a half billions of dollars which are annually spent in the United States for medical care. If we consider the medical dollar as a unit, we learn that about thirty cents of this dollar enter the pockets of the practicing physician directly, that about twenty cents are spent for hospital care, that twelve cents go to the dentists, that only five to six cents are allocated to the National and State Public Health Services and that nearly as much money as the practitioners of medicine receive themselves is spent for medicines alone, about half of which is probably squandered on worthless patented remedies (with a question mark) bought without doctors' prescriptions.

Three and a half billions of dollars is a large

sum, but when we find that the amount of money which the American public spends for entertainments, chewing gum, candy, cosmetics, etc., is four times as great it suggests that there has been plenty of extra cash in the pockets of our citizens and that perhaps we should fare better as a nation if *more* rather than *less* money should be spent in the quest of health and *less* rather than *more* in the quest of pleasure.

It may be well to remind you that the average annual income of physicians is under four thousand dollars a year and that of dentists nearly a thousand dollars more, while the medical overhead eats up nearly a third of the doctors' receipts. You are evidently not entering (in terms of American slang) a "get-rich-quick" profession.

These facts, however, will hardly deter the right thinking man from choosing a medical career. The college professor has already learned to view with complacency the greater financial return of his plumber and painter and perhaps even of his "butcher, his baker and his candlestick maker" (who is the modern electrician). He realizes that he is happier in a profession where "Toil unsevered from tranquillity" is possible, than in a trade whose motto is, "The devil take the hinder-most." Perhaps we may look forward confidently to a time when an aristocracy of brains and service will command more respect from the general public than an aristocracy of smartness and purchasing power. Be this as it may, we must all recognize that there must be an irreducible minimum of income in excess of expenses for the practicing physician, if he is to hold his head high enough to see over the always present clouds of food and clothing and education for himself and for his family. Nevertheless, the various schemes of voluntary or compulsory health insurance that are now being discussed and, to a small extent, actually tried in this country, are the inevitable response to a very real need of great masses of our people for adequate medical service which under present conditions they lack. Sickness that can never be predicted is still for too many people nothing less than a financial catastrophe. As Dr Olin West, Director General of the American Medical Association, has said, "The one outstanding problem for the medical profession today is the delivery of adequate scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life."

I would impress upon you the wisdom of taking an acute interest in these monetary problems of the public and of the medical profession, for some type of voluntary or compulsory health insurance is already in force in almost every important country in the world except in the United States. The hand is writing on the wall, and organized medicine ought to guide

the pen that this hand holds. Votes, not medical men, make laws that intimately concern both the physician and his patients. There must be a fairly general consensus among the profession, if medical men are to influence legislation that intimately concerns the good of their charges and their own ability to serve their patients with dignity and efficiency. Prevention of unnecessary illness does not appear to have been attained by any of the types of health insurance in force in the European countries, yet this goal is set and we must strive to reach it. After a sufficient period of trial, experience may be expected to blaze a trail leading to the ideal sought. It is already quite evident that in those countries where organized medicine has actively interested itself in these serious problems and has been able to influence legislation, the lot of both the general practitioner and his patients has been vastly better than in those countries where uninformed, though often well meaning, lay legislators have shaped and passed laws dealing with the health of the public and affecting both the type of service and the monetary reward of those entrusted with its maintenance. The practice of medicine is not a business. To those of us who love it, it must never become one. If it ever does, it will fail to attract that type of disciple who will be true to his Master. The holding of money-bags is ever fraught with temptation. It is worth while to ponder the old Basque saying, "With little we have but peace. It is enough."

Fees. We are faced with the question of fees. Most of us would be happier and, I fancy, wealthier if we had business agents to settle these questions for us. Many physicians in group practice enjoy the luxury of not knowing how much or how little a given patient has paid, or is expected to pay, for the medical care he is receiving. I am old-fashioned enough to believe, however, that it is important, almost a duty, for the physician to carry personally the burden of knowing enough of the financial condition of his patient to be enabled to estimate how much of a load of mental anxiety he is adding, while he strives to take away the load of physical discomfort.

"In nature there's no blemish but the mind. None can be called deformed but the unkind." The business secretaries of physicians or the financial agents of groups must be rare persons indeed if they are not more influenced by loyalty to their employers (a sometimes mistaken loyalty) than to the financial exigencies of the person seeking bodily relief. I have used the words, "sometimes mistaken loyalty" advisedly, because the longer we practice, the more fixed becomes our conviction that immediate successful results of treatment, even operative treatment, and satisfactory convalescence, are always

inhabited by anxiety and are always favored by peace of mind. The highest type of physician is something more than an artisan hired to do a job, or even an architect employed to draw up specifications for a house of health. He should also be available as a confidential family lawyer and as a priest to hear confessions. Few sensitive patients enjoy disclosing the contents of the family chest to a strange man or woman whom they may never see again. Pride, false if you will, but strong, turns the key that locks the door on many a family skeleton and the lid on many a family chest.

Standardization of Fees. Standardization of physicians' fees has often been suggested. In our opinion any general effort of this sort would be most unwise if that priceless personal relation between patient and physician that to a large extent now obtains is to be retained. Results cannot by and large be guaranteed or paid for on such a basis. Results depend quite as much upon the personality and condition of the patient with a given complaint, as upon the knowledge and skill of the physician, and this knowledge and skill and wisdom, as we know, varies enormously, in both degree and in kind, among practitioners of the healing art. Our sense of responsibility is increased when we reflect upon the very general trust which continues to be accorded to doctors by the body politic. It is a remarkable tribute to the square dealing of medical men, that the public with very little protest allows us to go on setting our own standards of conduct and trying to collect whatever we ourselves consider to be fair recompense of such conduct. There must have been very few buccaneers among the medical navigators of the past. It is our duty to see that there be very few in the present or in the future. There exist those who grossly abuse these privileges. They should be compelled by medical opinion, and if necessary, by medical action, to conform to the somewhat varied but none the less rigid rules of the game. If they are not so compelled, public opinion will surely demand that the many innocent must suffer for the few guilty.

Disclaiming any belief that the method of estimating the proper fee to be charged a patient, which I have followed for many years, is the only or even the best way, I shall describe it in outline because I have found it satisfactory to both patient and physician when the contemplated fee may be considerable and when I have no means of knowing the financial standing of the patient.

The first step is the obtaining of the patient's history by an unhurried and often lengthy interview at which only the patient and his chief medical adviser are present. The confidence of the patient which it is so essential to gain as early

as possible is most likely to be initiated at this first contact. We must view the patient with "the eyes of those who do not hesitate or compute, not questioning or appraising but unafraid and mild" (Stephens) retaining, however, the attribute of kindly and understanding authority, for familiarity in doctors breeds contempt in patients.

Then follow the various details of physical examination upon which, with the history, the diagnosis must be based and a plan of treatment finally proposed. If the plan proposed is accepted, my next step is to tell the patient that there are no regular or standardized fees for such service and to say that while the physician naturally wishes to obtain as fair a recompense for his services as is consistent with medical ethics, he cannot estimate the actual amount that would in his opinion be fair unless the patient is willing to tell him confidentially about both his financial resources and his financial responsibilities. I try to make it clear that this personal question is asked more in the interest of the patient than of the physician. I think I can remember no unfavorable response to such questions. On the contrary, the fairness and consideration of the method appeal to the patient and his cooperation is gained.

One other discussion of monetary matters seems to be appreciated by patients whose treatment is likely to be prolonged or to entail hospitalization. The purpose of this discussion is to give them an opportunity to make a rough estimate of such accessory expenses as x-rays, laboratory tests, physical therapy, hospital board and fees which very possibly will be required in the course of the treatment proposed and which will not be included in the fee paid to the physician for his personal professional services.

Such an interview and discussion while undertaken mainly for the sake of the patient, looking to his peace of mind, has not rarely resulted in my feeling entirely justified in charging a larger fee than I had supposed from the appearance of the patient he could easily meet without a catastrophic strain on his purse. Such talks may be wearisome but they are not unpleasant, and I believe they are more in consonance with the spirit and ideals of medicine than are interviews between the patient and a lay agent. They need never be stultifying; they are often illuminating, and they do not prevent us from trying, in the words of Nietzsche, "constantly to transform into light and flame all that we see and meet."

Unfortunately, we cannot leave the subject of fees without mentioning, only to condemn, what is called "fee splitting." Despite the efforts of the American College of Surgeons, it seems to be still a prevalent custom in many communities. It is perhaps more common in our own state than we like to believe. I think I have only once recognized its existence, when a prac-

titioner asked me almost directly and without embarrassment if I would give him a proportion of my fee if he should send me a patient. I told him as politely as I could, that as it had never been my custom so to do, I must decline his kind offer. The evils of the practice are at once apparent. No intelligent patient would agree that the selection of a needed consultant should be limited to one who would allow his family physician a "rake off." The ring of a clear conscience is a more pleasant sound than the jingle of more money in our pockets. The custom, when it has been of long standing in a community, is sometimes adopted by physicians without a realization of its iniquities. Education rather than harsh condemnation will often be more effective in rooting out the evil. If you make it an unbreakable rule to send your own bill for your own services to the patient directly and not through the doctor who refers the case, you will escape all taint of "fee splitting." In general he said that it is fairer to your patients and much more advantageous to yourselves if your bills are sent promptly, at least once a month, and are sufficiently itemized. The patient has a right to know regularly how much he is in your debt and for what services rendered he is being charged.

Investments. As I know nothing about business or finance, I am obviously a most unfit person to give you advice upon the subject of investments which Dr. Gay suggested should be mentioned. Dr. John Burnie has discussed this subject most ably and helpfully in one of his Gay lectures, copies of which are in the school library and may be read there. My observation has led me to believe that most physicians would not make good captains of industry. We decry self-treatment and criticize the layman who tries to steer himself out of his own bodily ills. Why should the doctor attempt to sail without a pilot on the sea of finance full of reefs and whirlpools (and stock pools) that not infrequently cause disaster to the most wary navigators? Most of us do better by investing in a wise adviser and I believe the five per cent of income such a pilot usually charges for services is the safest of investments.

Other than this, I have only very general advice to offer. The physician, according to the findings of the Committee on the Costs of Medical Care, must needs practice thrift as well as medicine. Being thrifty does not mean being niggardly, for no doctor should allow himself to be thus labelled by his colleagues or his charges. It would be better for him to be somewhat of a spendthrift, after he had accumulated the thrift to spend. A physician must strive to "see life steadily and see it whole" and this often costs money. There is much in the wise elder man's advice to a young man to "carry his money in a purse until he has reached forty and after that to carry it loose in his pocket."

My own experience leads me to counsel somewhat as follows

Live respectably always Neatness and immaculate cleanliness in person count much in a doctor

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Provide by insurance or otherwise for the family bed and board in the future It is worth a real sacrifice of income to have this worry lessened

Determine a reasonable annual sum for charity, else a physician is likely to give away more than it is fair or wise that he should

After this, live generously but if possible with increasing simplicity, learning gradually to discriminate between the essentials and the non-essentials of life It is quite too easy, as prosperity increases, to increase one's menage and to take on disturbing complexities, without adding to the sum total of happiness

Invest heavily in memories, by travel and by contacting with able men working along the same lines as yourself Periods of depression may wipe out the savings of a lifetime, but they can never erase memories

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School library Drs Woodward's, Robey's and Cotton's lectures are preserved in the files of the *New England Journal of Medicine* and I strongly advise you to profit, as I have done, by their careful perusal I acknowledge many debts of inclusion of material taken from these discourses

This is the first time that the committee in charge of carrying out the provisions of Dr Gay's bequest has had the temerity to invite a practitioner of a *special* branch of medicine to discuss the *general* subject of Medical Ethics I do not know why they did this, but I think they acted wisely, except in their choice of the specialist The first of my reasons for so thinking is that in any audience of medical students there will be numbered many who will probably eventually devote most of their careers to cultivating intensively a restricted field of medicine The second is that specialism is rife in these times Its dangers and its faults demand the attention of all practitioners, the vital, integral relation of the part to the whole needs constant emphasis Exclusiveness and separation need to be condemned, close association, team play and commonalty of ethics need to be encouraged

There is at present, and there always has been, much just criticism of the walls which many specialties have built around their limited fields and of the self-imposed incarceration within these walls to which specialists have submitted A specialty should not erect walls, rather it should constantly strive to make paths running out in every direction from its own field It should break down every barrier which interferes with the view of the whole domain of medicine Nevertheless, it is as unreasonable to condemn the *principle* of specialization as it would be to condemn general practice Many of you by this time must have become painfully aware of the impossibility of learning in a four or six or ten year medical course all that is already known The known facts comprise but a small part of the domain of medicine, its unexplored territories are vaster than those already surveyed and mapped Just ridicule should greet the narrow specialist, as the Sanscrit has it

'God himself can never make content

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A specialist who acquires a bag of tricks, be they ever so good, and plays only these over and over again is not comfortable in the company of medical philosophers Some of you, however, will feel the urge of Kipling's explorer

"Till a voice as bad as Conscience rang interminable changes

On one everlasting whisper day and night repeated—so,

Something hidden Go and find it. Go and look behind the Ranges—

Something lost behind the Ranges Lost and waiting for you Go!"

If you heed a voice calling you to such endeavor, you will probably turn into the right kind of a specialist, welcome in any medical company, able to join in the general conversation and to tell a good tale yourself.

There may be at least two rewards of specialism. One is, of course the contribution of new knowledge as to the prevention, the causes or the treatment of illness. The other is even greater, namely, the devising of methods which will be recognized to be of such proved worth that they disappear from the armamentarium of the specialist and become the common property of all general practitioners. Losing your own soul in order that you may find it.

Personal Ethics. I need hardly remind you of the corner-stones of Medical Ethics, of the availability of all medical knowledge and of the sin of secret remedies and of patented medicines or methods. I can think of no circumstance which would make it ethical for a graduate in medicine to receive money either from the sale of his own discoveries or from the proceeds of a concern thus trafficking in health. An epitome of the Hippocratic oath, older than Christianity, is in direct contravention to such practices. "I will follow that method of treatment which according to my ability and judgment I consider for the benefit of my patients and abstain from whatever is deleterious and mischievous." "Into whatever houses I enter I will go into them for the benefit of the sick." "Whatever in connection with my medical practice or not in connection with it I may see or hear in the lives of men which ought not to be spoken abroad I will not divulge, as reckoning that all such should be kept secret." This sentence of the oath is pertinent to the practice of all gentlemen as well as to medical practice, but it applies with peculiar force to physicians who in the days in which it was written were priests as well as doctors. Medicine, to be sure, has obtained a legal separation from its two original wives, Speculative Philosophy and Religion, but it has not actually divorced either of them. It still must nourish itself at the table of the former for it will always need philosophic contemplation to help it solve its many mysteries. With its other partner, Religion it often walks and hears secrets that should be as sacredly guarded as those given to any priestly father in a confessional box. Without these personal revelations it is often impossible to offer the help sought. They should not be discussed with one's own family nor with the patient's family, nor with medical colleagues. Medical men should never keep company with "Gossip." This lady is a loquacious jade, unreliable, untruthful, a disturber of the peace, and up to every sort of dangerous prank.

One exception to the almost unbreakable rule of non-revealing confidence may be demanded today that was not fully recognized two thou-

sand years ago. Neither the patient nor his physician has the right to conceal from the guardians of the public health the existence of contagious disease even if it falls into the class of those hidden infections which we speak of as the social diseases. Our duty to the health of his family and to the community in which he lives transcends that to the sensibility of the patient.

A few and perhaps unpopular words concerning the medical ethics of alcohol. Most of us believe in the saving that temperance is stronger than abstinence and we are debating no principle of morals. Unfortunately, although alcohol is a valuable drug, we must avoid at all costs exciting in the patient's or his family's minds the suspicion of habitual use or of over-use. A "breath" may have the force of a gale and capsize the boat. No matter what the patient's habits may be, the pot in this instance has a perfect right to call the kettle black. It is unfortunate that so many able physicians' careers have been injured, and not a few have been ruined, by the often unmerited remark of a patient or of a colleague that Dr. Blank drinks too much. Alas, Dr. Blank is the last person to hear of the slander.

No one has ever codified the laws of gentlemanly conduct. They are traditional. The physician as well as the layman is bound by the Golden Rule and by the code of chivalry. The more closely the doctor's character resembles that of the Perfect Knight in strength and skill and sensibility the better are his chances of becoming the perfect doctor.

Attitude Toward Colleagues. Certain general rules have been laid down that should obtain in regard to the relation of medical practitioners toward one another. Perhaps in no other profession has there developed through the ages so close a bond as that of the whole company of physicians. It resembles that which exists among the members of many fraternal orders. It has been faith in the purposes and practices of medical men in general that has sealed this bond and we must keep the seal unbroken. Bits of the ethical code of the Massachusetts Medical Society illustrate this attitude of loyalty to our colleagues. "If a physician is formally requested to assume charge of a patient or a family usually attended by another physician, he should do so only after notifying the latter." Patients surely have their rights and these are rights not only against what they may believe is bad or inefficient treatment, but rights against incompatibility and the conflicts of personality. The patient or some member of his family must be the one to notify the offending physician, but courtesy as well as expediency usually suggests that the new guide should get in touch with the old one and make it quite clear to the

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The Physician's Attitude Toward His Patients
Except for an occasional emergency, a physician is under no legal or even moral obligation to accept or undertake the care of a patient. It may be even immoral for him to do so if he feels himself unequal to the task. But the case once accepted becomes immediately both a trust and a responsibility.

With conscious patients, our first duty is to hear their story related by themselves and always with sympathetic and unprejudiced ears. Our next step may well be to obtain all the information we can from the sick man's attendants and from his family and, of course, from other medical advisers whom the patient may have consulted. Then comes the question of frequency of visits to the patient or from the patient. There can never be any working rule for this. The number of advisable visits must vary with almost every patient, depending upon his medical (but never upon his financial) exigencies, and upon his psychology. The physician or his chosen substitute should strive, however, to be always available to the accepted patient. Nothing is more disconcerting to those in ill health than for them to be unable to get in touch with their medical advisers or their accepted substitutes when there is real or fancied need for them to do so.

In contacts with patients the question often arises, "Shall we tell them 'the truth, the whole truth and nothing but the truth' concerning their condition?" We may be unable to answer the question even if a demand is made for the absolute truth by the patient himself. We often do not know the whole truth and patients often respect us more and retain the therapeutically valuable faculty of hope if we honestly admit the fact. It is so easy for us to be mistaken, and dogmatic statements, if unfulfilled, have a bothersome way of being remembered longer than those which prove to be correct. We must, on the other hand, avoid any semblance of "hedging," else we at once lose the patient's confidence. General advice will not help you to answer this question. The patient has every right to expect perfect frankness on the part of his physician, but unless you are absolutely sure (and how rarely can we be sure), do not destroy all hope. She may be "such a poor virtue that disappointment often pays her debts," but she is an enormous therapeutic asset. It is almost always good judgment and kindly action to explain to some member of the patient's family, if not to the patient himself, your feelings concerning the prognosis and your reasons therefor. If it is a fatal prognosis, we may well preach preparedness to our patients, but we should rarely sentence them to death.

This phase of the discussion offers me a chance to say something that I believe is worthy of consideration early in your career. I have found its consideration to be helpful late in mine. It is no less than an admission of lack of faith in either

the specificity or completeness of what is generally understood by the words medical and surgical treatment. I find it constantly more difficult to evaluate the importance of the effect that emotional states produce upon bodily functions and, therefore, upon recovery from illness. The profundity of these possible effects may be envisaged when we realize that the blush accompanying embarrassment or the blanching caused by fear, are produced by an actual and considerable dilation or contraction of the capillaries of the face. How vital and unfavorable an effect continued fatigue and worry may exert upon the circulation is worthy of your thought. How large a part emotion plays in digestion has been convincingly and exquisitely demonstrated in Professor Cannon's last Beaumont Lecture. He appears to give credence to a statement which has been made, that fully eighty per cent of persons who consult physicians because of digestive disorders do so because of some disturbing emotional factor. He says "Only gradually as new evidence came in did I learn that in addition to the well-known acceleration of the heart and rise of blood pressure that result from emotional disturbance, there is a complex of other changes including redistribution of blood in the body, a discharge of extra corpuscles from the spleen, a more rapid coagulation of the blood, an increase of blood sugar and a dilation of the bronchioles." How greatly recovery may be favored by rest and confidence suggests strongly that every physician, internist or surgeon, general practitioner or specialist, should search his patient's mind as well as examine his body. If he can lead him into a state of equanimity, his medicine and his surgery will be the more successful. I am far from meaning that we must all become psychoanalysts. Psychoanalysis involves real danger as well as possible better adjustment. The mind, like nature, seems to abhor a vacuum and while the unwary psychiatrist may successfully remove a large quantity of errors, unless he succeeds in putting back something more valuable than the stuff he removes, the old stuffing may be better than no stuffing at all and the last state of that man or woman may be worse than the first. False ideals must be replaced by new and truer ones if psychoanalysis is to be completely successful. I am convinced, however, that it behooves us to learn more of psychiatry and practise its healthful tenets if we are to fulfil our whole duty to our patients and receive the largest measure of the satisfaction which is the reward of work well done.

It is a sad fact that some of our patients will die in spite of, and perhaps because of, our earnest but mistaken attempts to aid nature in healing them. You remember the old saying of Paré, "I dress the wound but God heals it." We must accept this sorrow as a part of our discipline. I admire the attitude which one of your former lecturers (Dr Woodward) has taken in

former adviser that the change was not solicited. Unless this is done, the green-eyed monster often wakes and much valuable past information pointing the way out of the patient's difficulties may be missed. You will all have both these experiences of being discharged and of being employed. In the words of Samuel Barnet, "Unpopularity is no condemnation, neither is it an acquittal." In the medical game, as much of the time as is possible all our cards should be "on the table face up." Except in an emergency, be sure also before attending a case or administering treatment, to ascertain personally that the patient's regular physician will not be available within a safe period of time. Unfortunately, certain people are not above thus attempting to "check up" on their family adviser without his knowledge and without hoisting the anchor which may have provided safe mooring in the past. The commonest reason given for requesting such a visit is that the regular doctor is away. This needs personal confirmation, for he is sometimes sitting idle in his office and explanations after the fact are difficult.

The Massachusetts Medical Society Code goes on to say very properly that "Consultations should be encouraged in cases of unusual responsibility or doubt. Should there be a difference of opinion, discussion should be temperate and always confidential." "In all disputes, so much as there is of passion, so much as there is of nothing to the purpose, for then Reason like a bad hound spends upon a false scent." ("Religio Medici," Sir Thomas Browne). "A consultant should say, or do, nothing to impair the confidence of the patient or his family in the attending physician." We may add, the consultant should if possible see the case with the attending physician. Misquotation is easy. It is a good working rule that if you are called in consultation by the doctor in charge of a case, you should never accept that case for treatment unless the attending physician specifically requests you so to do. There may be occasional exceptions to this rule when the patient in spite of your advice to the contrary, insists upon discharging his former adviser and has notified him of this fact. Even then, in my opinion, it is wiser still to refuse to treat the patient yourself, but entirely proper for you to suggest some third practitioner in whose skill and judgment you have confidence. I dwell on this working rule a little at length, for it has been my observation that the exceptions made to it are still too numerous. They breed ill feelings easily and often, and this progeny has long life.

The Massachusetts Medical Society Code still frowns upon consultation with "irregular" practitioners and disciples of cults as being both unprofitable and uncomfortable. No interpreter exists who can talk in the two different languages in which such a pair of consultants must converse. In general, it is best to ignore but not to revile special cults or cultists. If one is dis-

turbed at the spread and apparent success of error, take down your volume of Oliver Wendell Holmes' Medical Essays and read "Homeopathy and Kindred Delusions." It will make you feel more comfortable. When special privileges are sought by cults through legislation, organized medicine should fight them tooth and nail, not to stifle competition, but in order to protect the public.

One other precept in connection with col-leagual relations, although it has been emphasized in previous lectures, seems to require reiteration. Never in the presence of the patient or the family, except in the rare instance of deliberate malpractice, should we speak contemptuously or even disparagingly of the methods of treatment administered, or of the result obtained, by the patient's former physician. Always assume that he has done his best. Every motive must have induced him to try to do so. Your best may prove to be no better than his. An unguarded, explosive remark, "My God, who did that?" (this is a quotation, not a sacrilege) may lead to an entirely unjust lawsuit being instituted against his former adviser. Unkind remarks of this sort are bad ethics and the repercussion from the blast may do more injury to you when you are summoned as a witness by the plaintiff's attorney than to the defendant whom your shot, thoughtlessly fired into the air, happened to hit.

Before we leave the subject of professional relations, it seems advisable to discuss briefly the apparently growing method of what is called group practice. The American Medical Association has seen fit to point out its possible evils and to discourage its more general adoption. By group practice is meant, not the association of physicians working together along the same lines, but a close corporation of a small group of general practitioners and specialists who, by referring all private patients to one another, attempt to provide them with adequate treatment for all ills. The advantages of such an organization to both patients and physicians are obvious. It is convenient and sometimes economical to the patients and always lucrative to the physicians comprising the group. We see group practice in its best form at such clinics as the Mayos in Rochester and at Dr. Crile's Cleveland Clinic. Such private clinics are really large hospital organizations controlled by dominating personalities whose medical standards are high. We see group practice in its worst form in smaller organizations outside of medical centers, the component members of which are often of unequal ability and experience, especially in the special branches. The patient believes that he is receiving the best possible consultatory advice or operative treatment which the community affords. This is unfortunately rarely the case and the patient suffers for the benefit of the clinic. We should be sensitive to this possible evil of group practice.

placed sweat Long is the road thereto and rough and steep at the first But when the height is achieved, then there is ease—though grievously hard in the winning" (Hesiod) Work, of course, and hard work, yet hard work does not necessarily involve a wild attempt to keep up with "the pace" In these days few doctors are burned at the stake but continuing overwork and overworry, the struggle to be a little more energetic than our fellows are at present burning up the vital energy of too many American physicians at the zenith of their power for good "It is the duration not the intensity of ideals that makes a great man" (Elihu Root) Too much "busy-ing" is the attitude of small men.

3 *Punctuality* Sir William Osler is quoted as saying that keeping every medical appointment on time will do more than anything else to favor the success of a young medical man's career There is much in this remark Punctuality means an always thereness-when-needed that both patients and colleagues appreciate greatly A patient resents having a prearranged visit postponed without notification and an on-time consultant feels annoyance if he is obliged to wait for an off-time one Dr Blank who is always late is almost as likely to be unsuccessful as Dr Blank who drinks too much

4 *Precision* Devotion to detail is always and quite properly not only grateful to patients, but gives them a sense of security The patient considers casualness an enemy to his health and a friend to his illness There is as clear a dividing line between precision and fussiness in medical treatment as there is in operative surgery Each stroke of the tongue as well as each stroke of the knife should be clean, and have a definite purpose Instruction should be given with as few and simple precise words as possible Every cut of the scalpel should be made with purpose, gentleness and precision.

5 *Prudence* Prudence connotes cautiousness but never timorousness We are sometimes forced to take risks for certainty may elude us, but the risk should be the safest we can plan and never a rash adventure There is no place in medicine or surgery for temerity Prudence is almost synonymous with good judgment Some men are born with a higher degree of this priceless asset than are others If it is not congenital, it may be acquired Dr Gay, the founder of this lectureship, was noted for its acquisition If you can learn how to form an opinion as to accurate diagnosis and appropriate treatment, you will have attained the first objective of your campaign Prudence bespeaks contemplation, contemplation brings calmness, calmness begets confidence, and good judgment is the name by which your patients will call the child you have bred

6 *Patience* Medicine is a relay race We must pass on the torch even if we do not light

many fires on the way "The end is forbidden" to many of us No matter how seemingly unproductive our work may be or how futile plodding research which does not "arrive" may appear, foundations can only thus surely be laid upon which those who follow us may erect structures of sufficient height to afford eventually a sight of the Promised Land In purely clinical endeavor also, patience is necessary Benjamin Waterhouse, first Hersey Professor of Medicine at Harvard, said, "Acute disease is sent by the Powers above chronic disease we bring on ourselves" Chronic diseases are still the chief causes of disability Their fields are the least well tilled The harvest is plenty, but the laborers are still too few To treat chronic disease successfully requires unending patience with ourselves, with our charges with our colleagues, with the institutions which we serve yet the rewards of the exercise of patience are among the richest and most heartening of a medical career

7 *Piety* To be consistent with my title and asking you to bear in mind that "a sinner may preach a good sermon" and that speaking *ex cathedra* is farthest from my thought, I am including piety as a medical virtue because, as Mr Agassiz said at the inauguration of Professor Conant as President of Harvard, "In a just estimate of the real values of life the spiritual outweighs the material" Samuel Johnson, master of accurate statement in his famous dictionary defines piety as "the discharge of duty to God and to those in superior relation" The relation of a doctor to his patient is surely a superior relation, and we all wish to discharge our duty Medical piety has no connection with loud prayers in the market-place It does not involve adherence to any creed or religious sect It necessitates no conversation with patients on religious subjects Perhaps the only disturbing characteristic one detects in the so-called modern generation (as if every new generation were not modern) is that it seems to be in danger of losing the faculty of Wonder A physician can ill afford to lose it It is the piety like that of Sir William Osler that I have in mind Behind his bovish practical jokes and his quaint humorlessness was a deep love of humanity and a strong faith in a mysterious purpose The mystery he did not try to penetrate but to worship while he strove to fulfill the purpose

In the building of your medical careers, I can do no better than to suggest that the edifices of character and ethics which you are to erect are likely to be creditable if you follow the only directions which were given to the architects of the Cathedral of San Miniato nearly five hundred years ago These inclusive building instructions were that it must be "worthy of a heart expanded to much greatness"

One more bit of advice and I am done It is

regard to a question which is likely to trouble you at the bedside of a patient whom you believe to be dying. Dr Alfred Worcester, one of the company of the great physicians who, when in practice, was accustomed to sit beside his patients during their last hours or even days of life, has testified to the fact that death agony is rare, and that the end is usually free from pain. In the presence of a peaceful death, the question I have mentioned will not arise. If suffering is acute and the end inevitable, it will arise. "Have I the right to ease these distressing last hours by pain-relieving drugs no matter what dosage is necessary to accomplish this purpose?" The right cannot be granted to you legally for quite obvious reasons. We have all of us seen cases we believed would be quickly fatal eventually recover. And yet I feel as Dr Woodward did when he said, "I have no sympathy with the man who would shorten the death agony of a dog but prolong that of a human being."

Attitude of the Physician to the Community
You well know that traditional attitude of the rural physician toward his community and the community's attitude toward him very peculiar, very beautiful and very rewarding. We cannot keep all of it in large urban centers. Specialism interferes with it, not only medical specialism, but the specialism of the other professions and of business. None the less, the physician may preserve the rural ideal of trusted adviser in regard to family health, even if he ceases to be the priest, the lawyer and the financier all in one. The ideal needs cherishing in these days.

I may be mistaken, but I think there should be a powerful doctor on the board of trustees of every hospital. I am convinced that few of us should shrink from what is termed medico-legal work. It is time-consuming and often annoying, but there are laws involving physicians and demanding good physicians for their just execution. I urge you strongly to read Dr Cotton's 1932 lecture on the subject of "Medicine, Ethics and Law."* It would be futile to try to say over and over again the things he has said so well in regard to the Workmen's Compensation and Insurance Laws and in regard to medico-legal testimony. We most of us carry liability insurance against malpractice suits, either independently or through our state societies. It is safer to do so and in unimportant cases involving no principle, it is often justifiable to allow our insurance agents to settle our cases out of court. I believe, however, that sometimes it is our duty to fight our cases through in court, disagreeable as it may be for us personally to do so. If our cause is just and we win, a strong inhibition is established against the bringing of future suits against other members of our brotherhood.

It is venturesome to offer an opinion as to what the attitude of the physician toward life in general should be. Yet since so strange a title as the Theology of Medicine has been chosen for a lecture on Medical Ethics, it may not be entirely out of place. There is undoubtedly a place for reformers, without reform progress lags, but surely not everything one meets needs to be reformed. When we feel, as indeed we should at times, that we are in partnership with the Almighty, it is necessary to remember that the Almighty may have other partners. The open mind seems to be the attitude for which to strive. If our minds are closed, if we fail to consider that there is great likelihood that the other fellow's brain may be as fine as our own and his motives as high, we may fall into the pit we are digging for our opponents. We must try to obtain the other side's point of view. It is possible that our own is obstructed. "Protests against (supposed) error (may) become in their turn error." The open mind is the best guide to the open road. Slavery to tradition is bad, "Idolaters recognize no change," but respect for tradition is good. Tradition is strong and there are usually cogent reasons why a medical practice has grown into a tradition. Dr Jowett used to say that "The great man is he who does original things in a conventional way." I am not preaching lethargy and complacency, but trying to plead for alertness combined with wisdom and with what the theologians call reverence. Jesus commanded his disciples to be "wise as serpents," but he then admonished them to be "harmless as doves."

In conclusion, it may also be fitting for those to whom is assigned the task of giving you the fruits of what experience they have had, to discuss occasionally and briefly what they may consider to be the attributes of ethical success. Among the many we will choose seven, which seems to be the Biblical number.

1 *Preparedness* Preparedness not to fight men but to conquer sickness. The initial preparation you are now experiencing is the first step. Next comes the formation of a habit of always being a little "ahead of the game," of being prepared not only for the probable but also for the possible. The acquiring of this faculty neither makes a man a pessimist nor unmakes an optimist. Preparedness does not suggest "looking for trouble," per contra, the surest way of avoiding this unpleasant fellow is to be ready to meet him if he turns up. It will diminish the number of emergency disasters and temper the blows of self-castigation when disasters occur. "Could I have acted more wisely?" is a much less scourging question to be obliged to ask oneself than, "Why was I caught unprepared?" *Semper paratus* is an excellent medical motto.

2 *Persistence* William the Silent said, "It is not necessary to have hope to begin nor success to persevere," and this is true, but "Before the gates of excellence the High Gods have

level, particularly in emaciated and advanced cases. Similarly patients with diabetes are subject to sudden falls in blood sugar and unless analyses are made at frequent intervals it is easy for insulin which was once the correct amount to become dangerously excessive. An excellent illustration of the variation in the fasting blood sugar of the tuberculous diabetic is afforded by the record of a patient, aged 35 years, kindly sent me by Dr. A. S. Pope. Blood sugar analyses, recorded usually once a week varied from 85 to 350 mgs during a period of almost two years. Her diet was carbohydrate 102 grams, protein 100 grams, fat 150 grams. The insulin dose varied somewhat according to her condition, ranging from 30 units to as much as 120 units a day. These variations were in large measure due to various complications. She was very ill on admission to the sanatorium with a positive sputum, the left lung was involved throughout and the right to the sixth dorsal spine. She developed pneumothorax and ischial abscess, a severe neuritis of both arms and chronic diarrhea. At the end of the period, her chest and general condition were much improved with a corresponding reduction in the insulin dosage.

b) *Insulin Dosage and Tolerance* Variations in tolerance of the tuberculous diabetic are a frequent occurrence. The remarkable gain in tolerance which occurs in tuberculous cases as the disease advances has been noted by Joslin⁶ by Umber⁷ and Grote⁸. In some cases especially older patients an elevation of the renal threshold for glucose is encountered. The urine is sugar-free even when hyperglycemia is marked, especially if arteriosclerosis is advanced and the diabetes is of considerable duration. However, true gains in tolerance not dependent upon changes in the threshold are not infrequent. Sometimes such change occurs almost overnight as in Case No. 11471 (cited below). More frequently the change is gradual as in Case No. 344 whose carbohydrate tolerance changed from minus 85 grams in July, 1910 to plus 60 grams in April, 1912. Such remarkable gains in tolerance are not the rule. In general the development of tuberculosis particularly if it is associated with general toxic symptoms has an unfavorable effect upon diabetic tolerance. This effect diminishes as the tuberculosis improves. Further, one must not forget that almost any diabetic gains tolerance under a constant dietary regime in a hospital. Labbé et al⁹ report five cases of a decrease in tolerance produced by the development of active tuberculosis. Case No. 4763 increased insulin during the month after tuberculosis was at its height, but a year later her insulin dose was reduced one quarter. Le Noir's remarkable case, a boy 19 years of age, treated by pneumothorax in 1926 had coma in 1927. In December 1928 a cataract had disappeared. He was taking 280 units

daily, and had received a total of 132 000 units. The maximum dose required by any of our cases not in coma was 83 units daily used by Case No. 2179 in a California sanatorium.

The average insulin dose of 18 tuberculous cases at the Deaconess Hospital between the ages of 15 years and 29 years was 39 units. Their average weight was 118 pounds and age 23 years. Joslin¹⁰ tabulated 40 cases (non-tuberculous) in the same age period, finding the average insulin dose varying from 34 units for cases treated in 1923 to 47 units for cases treated in 1926. The average was 37 units daily. The average age of his cases was 22 years and the weight varied from 110 to 137 pounds.

Twenty-five tuberculous cases between 40 and 54 years of age received an average of 25 units daily. For a similar group of 40 non-tuberculous diabetics tabulated by Joslin the insulin dose varied from 11 units in 1923 to 27 units in 1926. The carbohydrate of the diet varied from 64 to 99 grams. The average weight of the tuberculous was 129 pounds and the average weight of the non-tuberculous was 125 pounds. If one classified cases according to the duration of the diabetes, the average insulin dose at discharge from the hospital for 36 tuberculous cases with duration of diabetes less than two years was 26 units. For 50 cases with duration over five years it was 28 units. On the average, therefore the insulin dose of diabetic patients with tuberculosis does not vary greatly from the average for the sample groups of diabetics tabulated by Joslin. These surprising results indicate that the harmful effect of tuberculosis upon diabetic tolerance is easily exaggerated. No one can doubt that during fever and toxemia of an active advancing process the insulin requirement will be increased. On the average, however, when careful dietary regime and rigid adjustment of insulin dose to avoid hypoglycemia and wastage of insulin are employed, no evidence of a great increase in the insulin requirement for tuberculous diabetics appears.

c) *Hypoglycemia* Hypoglycemia is not rare in tuberculous diabetics undergoing dietary treatment in the hospital owing to simultaneous rapid changes in diet and insulin dosage. Both factors have a pronounced effect upon the blood sugar and the urine sugar so that occasional hypoglycemia may be expected. However, only 15 patients were found to have had hypoglycemia while under observation at the Deaconess Hospital.

The symptoms may vary greatly from the standard sudden onset of weakness, tremor, sweating, extreme hunger followed by convulsions. Any or all of these symptoms may be absent. Diplopia, occurring as the sole symptom, or other purely nervous phenomena must be kept in mind. Case No. 4743, a nurse, aged 25 years in December, 1932, was thought to be merely hysterical at 4:30 P. M., but her blood

not my own, nor was it dictated by the black-coated clerical Mather, but is supposed to be the counsel which Robert Louis Stevenson would have given to young men "Do not assume an attitude toward life at all, but just live Do not be a spectator or critic of the business of living, but throw yourself into the heart of it Be all there and say no more about it"

THE ASSOCIATION OF DIABETES AND TUBERCULOSIS*

IV Treatment, Prognosis and Prevention

BY HOWARD F ROOT, M D †

OUTLINE

A Treatment

- 1) Insulin, frequency and size of dose
 - a) Blood sugar
 - b) Dosage and tolerance
 - c) Hypoglycemia
 - d) Resistance to
 - e) Nutrition
 - f) Duration of life
- 2) Diet
 - a) High carbohydrate
 - b) Protein and Fat
 - c) Calcium
 - d) Restriction of salt
- 3) Acidosis and Coma
- 4) Remarkable Cases
- 5) Of Tuberculosis, General Considerations
 - a) Sanatorium vs Home
 - b) Collapse Therapy
 - c) Arrest
 - d) Occupation

B Prognosis

- 1) Effect of Insulin
- 2) Affected by advanced stage of Tuberculosis
- 3) X-ray findings
- 4) Other factors

C Prevention

A. TREATMENT 1) **INSULIN** General agreement upon the great value of insulin in the treatment of diabetic patients with pulmonary tuberculosis has taken the place of the early hesitancy. Unfavorable reactions, reported at first by Gudemann¹, Dreyfus-Sée and Rathery², Blum and Schwab³, Dunner and Dohrn⁴, and Wagner⁵, were in part due to protein impurities, later removed by better manufacturing methods. In young diabetics insulin should be given as soon as the diagnosis is made. In children and young adults who have been exposed to an open case of tuberculosis insulin should be given promptly and continued unless it is known that exposure has ceased, the patient's weight and general health are normal,

and the urine and blood sugar are normal with an adequate diet.

Frequency Insulin may be given from one to four times daily according to the severity of the diabetes or the need for a patient to have a diet well above the minimal caloric value in order to insure gain in weight. Usually a given amount of insulin is more effective if divided into two doses, one given before breakfast and one before supper than if given in a single dose. Frequently, especially in childhood, a third dose may be added at bedtime because in diabetes of more than slight severity there is a definite rise in blood sugar during the hours of sleep. Insulin at bedtime controls this hyperglycemia and may allow the patient to start the day with a blood sugar relatively lower and therefore controllable by a smaller dose of insulin.

Size of Dose Few diabetic patients when using a well-planned diet require more than 50 units of insulin in the 24 hours. Much larger doses may be used when necessary if the patient is protected against reactions by frequent giving of carbohydrate in small amounts, such as 10 grams every 2-3 hours. Patients with tuberculosis are affected by insulin in varying degrees in different stages of the disease. Patients in terminal stages of the disease with extensive processes and especially with low plasma cholesterol values are sometimes so sensitive to insulin that five or ten units may bring about hypoglycemia of a very serious degree. Among 144 cases the average insulin prescribed at discharge at the New England Deaconess Hospital was 28 units. The smallest daily dose was two units and the maximum dose 83 units.

The distribution of injections in various parts of the body so that injections will not be repeatedly given in the same neighborhood is desirable. Atrophy of subcutaneous fat has not been noted in cases with pulmonary tuberculosis although it is not rare in diabetics generally.

a) *The Blood Sugar and Insulin* Although blood sugar analyses are not indispensable in the treatment of diabetes, their value as an aid in adjusting diet and insulin is attested by their frequency in the case records of the best sanatoria and private hospitals where tuberculous diabetics are received. The blood sugar in non-diabetic tuberculosis at times falls to a low

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†Root—For record and address of author see "This Week's Issue" page 226.

haw¹⁴ whose patient, a man of 38 years, had had tuberculosis for many years. He had bilateral pleurisy at 18 years of age. In 1929, because of bilateral tuberculosis with a cavity, pneumothorax treatment was given. When insulin was begun local reactions occurred but on the twenty-fifth day of treatment general urticaria with itching lasted four hours. A second injection gave the same result. Insulin from three different companies was employed and that from the third company gave no such urticaria. He concluded that in two insulin preparations a precipitable substance was present which caused reactions similar to those observed in protein sensitive cases. In a considerable proportion of all diabetic patients local sensitivity to insulin is observed during the first few weeks of insulin treatment. Redness with slight induration about the site of injection with itching is noted. Such sensitiveness as Grishaw describes has not been seen in any of the cases of this series.

d) *Resistance to insulin* has been reported by Mohler and Goldburgh¹⁵ in a man of 72 years with alcoholic history, diabetes, cirrhosis of the liver and pulmonary tuberculosis. The onset of the diabetes was in 1919. In 1928 tuberculosis was discovered and he had a hemorrhage. Sputum was positive for tuberculosis. In 1929 he required 470 units of insulin a day and the dose was gradually increased until he received 1150 units on November 3, 1929. In a non-tuberculous case with hemochromatosis from the Deaconess Hospital series, 1600 units of insulin daily were required (Root¹⁶). No instance of resistance to insulin in a diabetic complicated only by tuberculosis has come to my attention. The use of the term "resistance" should be restricted to cases requiring more than 200 units a day for considerable periods of time, so as not to include periods of acute illness as in coma or severe infections.

e) *Insulin and nutrition*. That the earlier ideas regarding the harmful effects of insulin upon pulmonary tuberculosis may be discarded is indicated by the many reports of its usefulness in treating non-diabetic tuberculosis.

Barker¹⁶, in recommending the use of insulin in a non-diabetic man with pulmonary tuberculosis who was 60 pounds under weight, reports his use of insulin in nervous emaciated individuals. Jaquierod¹⁷ and F. M. Allen²⁸ describe excellent results with insulin in treating pulmonary tuberculosis and quote other observers. In one case the local urticarial reactions required discontinuance of the treatment. The possible effect of insulin in reducing the carbohydrate tolerance of non-diabetics must not be forgotten, as noted by Blotner²⁹. This effect so far has been only temporary.

From this series of 144 tuberculous diabetics who received insulin, remarkable instances of improvement in nutrition may be cited. Case No 3775 male aged 64 gained 20 pounds in a year

with insulin 30 to 40 units daily. During the same period roentgenograms showed reduction in size of a cavity. Case No 5448, male, aged 51 when tuberculosis was discovered in 1926, gained 30 pounds during the next six months in a sanatorium. Death in July, 1929 was due to cerebral hemorrhage. The remarkable gain in height and weight of Case No 2274 is recorded under figure 9, Chap III, *New Eng J Med*, Jan 18, 1934. In spite of diabetes and pulmonary tuberculosis he grew 15 inches and gained 53 pounds between 1921 and 1931 under home treatment. Gain in weight is the rule with adequate diabetic and sanatorium treatment except in the most unfavorable cases.

Omission of Insulin. The effect of tuberculosis in a toxic stage upon the reaction of a diabetic to insulin may be compared to the effect sometimes observed with diabetics under the influence of other types of infection. In table 2, Chap III, *New Eng J Med*, Jan 18, 1934, are summarized the records of two cases at the Deaconess Hospital who, during the course of long-continued pyogenic infections, developed a remarkable tolerance and were able to give up insulin. Rabinowitch¹⁸ describes a non-tuberculous man with infected prostate, near coma, requiring 40 units a day, who eventually was able to take a diet of 218 grams carbohydrate but also to give up insulin entirely. Case No 7565, aged 39 (non-tuberculous), required 70 units during coma in the fourth month of pregnancy, left the hospital with a diet of 161 grams carbohydrate and later required no insulin. Such cases following a stage of coma are not very common.

Omission of insulin after operation occurred with Case No 3559 who entered the hospital with 5.0 per cent sugar in the urine and a blood sugar of 0.33 per cent. Her maximum dose was 40 units following amputation of a leg for gangrene. During the last 10 days of her hospital stay no insulin was given and the blood sugar was 0.11 per cent before her discharge. Such incidences of improvement occur without tuberculosis in insulin cases. Indeed even before the discovery of insulin such improvement was not unknown. It is not rare in cases of gangrene after operation and is not sufficiently emphasized by most writers.

Case No 11471 shows the extraordinary effect of a small dose of insulin in a terminal stage of tuberculosis. With only 15 units of insulin within 12 hours the sugar which had been 7.2 per cent in the urine disappeared and the blood sugar fell from 0.42 per to 0.05 per cent. Even though she received glucose solution a spontaneous hypoglycemia occurred later. She received no more insulin until her death a week later. It is notable that the plasma cholesterol was only 72 milligrams on November 3 and 68 milligrams on November 6.

sugar was 0.04 per cent. Case No. 11471 suddenly developed generalized convulsions without any warning. Monoplegias or an unresponsive state with flaccidity of all muscles has been observed. When in doubt a blood sugar analysis at the time of symptoms is essential. Every tuberculous patient, therefore, needs to be on guard against hypoglycemia.

In 15 tuberculous diabetics a total of 35 blood sugar values of 0.08 per cent or lower occurred. Six of the 15 were males. Nine were 30 years of age or younger and only one over 50 years. The greater liability of the blood sugar in youth accounts for the greater frequency of insulin reactions at this period generally, whether tuberculous or not. The most frequent period of development is between 11 A. M. and noon, although late afternoon and the evening between 9 and 11 P. M. each had five instances. The time elapsing since the preceding insulin dose in one case was only a half hour but usually the period was from three to five hours. Case Nos. 2274 and 2687 had hypoglycemia without preceding insulin before pulmonary tuberculosis had developed and later hypoglycemia of similar degree when tuberculosis had developed.

The carbohydrate of the diet in the preceding 24 hours varied so widely that the only conclusion to be made is that it has less influence than the amount of insulin given and the condition of the patient, especially the degree of emaciation, and toxemia. Thus in Case No. 11471 whose record is summarized in table 1 only 15 units of insulin produced almost fatal hypoglycemia. She had extensive tuberculous pneumonia and died within a week. For autopsy report see table 1, Chap. II, *New Eng J Med*, Jan. 11, 1934.

The duration of diabetes has little influence upon the liability to hypoglycemia. In general,

although hypoglycemic reactions have occurred both in cases with active and inactive processes, patients with advanced lesions and acute toxemia seem especially liable to them.

It is important to remember that Addison's disease is characterized by hypoglycemia and its occurrence with small doses of insulin may give the clue to the diagnosis. Gowen¹¹ describes a patient, female, 54 years of age with old fibroid pulmonary tuberculosis, pigmentation of the skin, basal metabolism minus 34 per cent, blood pressure systolic 84, diastolic 54 and blood sugar 0.166 per cent. Five units of insulin repeatedly produced severe hypoglycemia reactions. Treatment with thyroid extract, adrenalin, and whole gland suprarenal gave temporary improvement. Autopsy revealed atrophy of the adrenals, absence of medullary tissue, and compensating hyperplasia and hypertrophy of the remaining cortical cells. Reference is also made by Gowen to six cases reported by Allen, 2 cases by Umber¹² and one by Unverricht¹³.

In Addison's disease atrophy or destruction of the epinephrin-secreting tissue destroys an essential component of the insulin-antagonistic system. Without epinephrin to be liberated when the blood sugar falls under the influence of insulin and thus no key to unlock the stored glycogen, the normal check upon the descent of the blood sugar is lacking.

Another essential in the insulin-antagonistic system is a supply of glycogen readily available in the liver. Where this is diminished or absent under conditions of extreme emaciation, malnutrition or even of tuberculosis of the liver as in Case No. 11471, hypoglycemia may result with small doses of insulin.

Adenomata or carcinomata of islet tissue must not be forgotten as a cause of hypoglycemia.

Sensitiveness to insulin is described by Gris-

TABLE 1

CASE No. 11471, Housewife. Onset of Diabetes at 44 years in July, 1928. Maximum weight 167 net, 1928. Weight November, 1932, 80 pounds. Died November 11, 1932—Tuberculous pneumonia with tuberculosis of liver, spleen and ileum.

Date	Urine		Blood Sugar		Diet				Insulin Units
	Sugar Per Cent	Nitrogen Gm	Per Cent	Time Taken	Carb Gm	Prot. Gm	Fat Gm	Cals	
1932 Nov									
3	6.0		0.42	7 P. M.		One meal			
3-4	5.0				39	10	20	376	15
4-5	0.2		0.05	Fasting	123	39	78	1350	15
5-6	Trace		0.04	8-15 A. M.	149	34	70	1362	0
			0.06	Noon					
6-7	0		0.21	11 P. M.	133	39	70	1318	0
7-8	0	5.0			123	36	77	1329	0
8-9	0	5.5	0.09	Fasting	138	39	74	1334	0
9-10	0	6.2	0.17	11 A. M.	129	42	84	1440	0

NOTE

Blood non protein nitrogen 30 milligrams
 White blood count 2,400 Polymorphonuclear leucocytes 77, lymphocytes 19 large mononuclears 3 eosinophiles 1
 Blood calcium 9.1 milligrams Blood phosphate 2.5 milligrams
 Plasma cholesterol 72 mgms November 3

sputum Their average age was four years less and the average duration of diabetes was 7.2 years or (29 per cent) greater The average duration of the diabetes was 7.2 years up to July, 1932 All are living in December, 1932

a) *High Carbohydrate Diets* The use of higher carbohydrate diets was begun among a few diabetics at the Deaconess Hospital about 1923 The average carbohydrate prescribed has steadily increased, although it has not for any group reached the amounts advocated by Sansum et al.²⁰ in 1926 In the 10 cases summarized above the average carbohydrate was 157 grams Kutschera-Aichbergen²¹ studied three cases of severe diabetes and exudative tuberculosis on varying diets When large quantities of carbohydrates and the corresponding amount of insulin were given, the tuberculosis lost its former malignancy and took an unusually mild course Kutschera-Aichbergen also noted an increased sugar tolerance In spite of a greater carbohydrate intake the insulin requirements are now less than they were before, during the time when the patient's carbohydrate intake had been curtailed Deljannis and Petassis²², reporting in 1932 from Vienna 70 cases of tuberculosis and diabetes, describe a diet of approximately 100 grams carbohydrate, 70 grams protein and 150 grams fat

Rosenberg and Wolff²³, on the other hand emphasize "überinsulierung" and apparently have used diets containing from 24 to 60 grams carbohydrate with sufficient insulin to produce a normal blood sugar, a sugar-free urine and indeed, a balance such that insulin reactions are near at hand They hold that such treatment tends to convert the exudative type of tuberculosis into the fibrosing less destructive types They also emphasize increasing the protein above one gram per kilo and calories above 25 per kilogram if necessary to maintain positive nitrogen-balance On the whole we conclude that in the great majority of cases the diet should include approximately 150 grams carbohydrate

6) *Protein and Fat in the Diet* 1) Protein McCann²⁴ studied the metabolism of non-diabetic patients with pulmonary tuberculosis and as a result recommended for the average adult a diet containing from 60 to 90 grams protein, fat liberally, and carbohydrate sufficient to make the total calories from 2500 to 3000 These measurements agreed with other observations in showing that there tends to be a loss of nitrogen from the body in active tuberculosis and he therefore warned against too great a restriction of protein Perhaps 120 grams a day is a maximum and 50 grams a good minimum Allen²⁵ believes that the gain in weight made possible by the use of insulin even in non diabetic tuberculosis improves the resistance and aids in healing 2) Fat The various relationships of fat in the diet are

complicated Grote⁶ feels that any fever causes a heightened tendency toward the breakdown of protein which would give free amino acids and a tendency toward acidosis He prefers a diet rich in fat To one man sixty years of age with cavities he gave only ten grams of protein daily with a high carbohydrate in the diet and obtained a positive nitrogen balance Now, however with insulin he does not feel that such limitation in protein is necessary Dehydration and the use of salt-free diets tend to help exudative and inflammatory lesions Rapid changes may be made in fat intake without finding any evidence of change in the basal metabolism It is well-known that the human body can hold in reserve large amounts of fat and draw on them at will On the other hand it has been said that animals overfed on fat showed an increased resistance to tuberculous infection in contrast to the lessened resistance manifested by animals fed chiefly on carbohydrate McCann found that for one unit of heat produced from dextrose there is nearly 30 per cent more carbon dioxide than that derived from the same energy produced from fat, so he advised a diet composed largely of fats up to capacity as the one which produces the least demand upon the function of the damaged lungs

Recently Sansum, Rabinowitch, Geyelin and others have advocated diabetic diets containing lesser amounts of fat In fact as little as 40 grams a day have been used Under such circumstances carbohydrate may be increased to from 200 to 300 grams a day Whether such extreme reductions in the fat of the diet are desirable seems uncertain Best²⁶ has shown that the depancreatized dog will not live even with insulin for an indefinite period without certain lipid substances Thus whole pancreas was fed successfully Then lecithin was used and finally cholin alone would prevent the fatty deposits in the liver which otherwise gradually destroyed its function and led to death of the animal We have so far not felt justified in reducing the fat of the tuberculous diabetic below 90 grams and in many cases have given from 100 to 150 grams in order to secure adequate calories

c) *Calcium in diet* Decalcification of the tissues has repeatedly been proposed as an etiological factor in the development of tuberculosis In diabetics loss of calcium occurs during periods of acidosis and diarrhea The diabetic diet, if milk, cheese and dairy products are restricted, may be deficient in calcium A deficiency in calcification of bones of diabetic children was observed in cases not adequately treated with insulin, as well as in older patients, according to Morrison and Bogan²⁷ Therefore, it seems rational to consider the possibility that calcium therapy, at least in the form of a diet planned to contain a minimum of one gram of calcium a day, may be beneficial A glass of milk and an ounce of cheese add 0.4 gram cal-

Case No 5976 had a very large irregular but not nodular liver. The right lobe was larger than the left. The spleen was not felt. On April 15, 1927 she had 5.2 per cent sugar in the urine and the blood sugar was 0.28 per cent. She has had angina pectoris since 1921. X-rays at this time showed calcified tuberculous glands in the abdomen and calcified tracheobronchial glands. Insulin dose was 27 units maximum. In August, 1930 she returned to the hospital with a cough, sputum and the x-ray showed a large wedge-shaped area on the left with its base in the second and third interspaces. The sputum was negative. Insulin was omitted within a few days. Possibly she represents a case in which cirrhosis of the liver was the important factor in bringing about an apparent disappearance of the diabetes.

In general insulin should rarely, if ever, be omitted in a child with pulmonary tuberculosis although it may be necessary to omit it in emaciated, advanced cases of any age in a terminal stage. Certain cases in moderately advanced or far advanced stages of tuberculosis show such an extraordinary gain in carbohydrate tolerance that insulin at times may be omitted especially if the blood sugar is normal or tends to fall to a hypoglycemic level. In preventing tuberculosis and in treatment of early stages, control of the diabetes is of fundamental importance. In our children it is among the group with least well controlled diabetes and failure to adhere to diet that tuberculosis has developed.

f) *Insulin and Duration of Life* Among 144 cases who have received insulin, 70 are dead. The average duration of life figured from the onset of diabetes in these fatal cases was 8.9 years. If we exclude Case No 1257 with duration of 23 years on the ground that tuberculosis was healed, at autopsy, the duration is reduced to 8.6 years. In 1928, Joslin tabulated the duration of life of 600 fatal diabetics, who had died between August, 1922 and August, 1926. The average duration of life for this group was 7.4 years. The surprising conclusion that, even in fatal cases, pulmonary tuberculosis has not shortened the life of the diabetic must be qualified. In the first place among my 70 cases, deaths as late as November, 1931 are included, allowing a much longer period for the beneficial effects of treatment. In the series of 600 diabetics (non-tuberculous) some, although probably not the majority, had received no insulin. Furthermore, the exclusion of living cases lowers the average duration of life relatively more in the non-tuberculous than in the tuberculous since in this way the large group of young diabetics who now live for long periods are omitted, and the great majority of deaths occur late in life when many other factors enter in. Nevertheless there can be no doubt

that insulin treatment increases the duration of life of the tuberculous diabetic. Among 92 fatal cases treated without insulin the average duration of life from the onset of diabetes was 5.6 years for 18 females and 6.0 years for 74 males. If two exceptional cases with diabetes of 21.1 and 32.4 years' duration be excluded, the average duration for the entire 90 cases is but 5.4 years, as compared with 8.6 years for the 70 cases treated with insulin. The diet for the tuberculous diabetic should not be such as to bring about undernutrition. On the other hand the one principle upon which all students since Bouchardat have agreed is that control of the diabetes is of fundamental importance in managing the course of the tuberculosis. Therefore, it is necessary to plan a diet and insulin treatment so that the blood sugar will approach normal and the urine be sugar-free as much of time as is practicable without the danger of insulin reactions. Fortunately almost any dietary combination can be so managed with the aid of insulin as to maintain a reasonable control of the blood and urine sugar.

2) *DIET* An analysis of the records of the last ten cases of active pulmonary tuberculosis in diabetics treated at the Deaconess Hospital in 1931 and 1932 shows that all but one were males and the average age was 36.2 years. In two cases the tuberculosis clearly antedates the diabetes. In Case No 3141, a chronic process began at the age of 39 years. The hospital stay varied from two to six weeks, when all but two were transferred to sanatoria. The changes in weight were slight, in accordance with the short period of observation.

No patient had less than 100 grams carbohydrate even during the first week when glycosuria was marked. At discharge the diets contained on the average carbohydrate 157 grams, protein 83 grams and fat 116 grams, calories 2209. The average calories per kilogram body weight were 34. Weskott¹⁹ advised 35-40 calories per kilogram. Insulin was omitted in one case. The amount prescribed in the other nine varied from 12 to 77 units. In five cases the insulin dose was reduced during this period of treatment, in four it was increased and in one it was unchanged. The average daily dose was 42 units for both the first and last weeks. For a group of 30 standard non-tuberculous diabetics treated in 1933 at the Deaconess Hospital the average daily dose of insulin was 26 units on the last day of hospital treatment. Their diets contained an average of 153 grams carbohydrate and only 28 calories per kilogram body weight. More important in its influence upon the insulin dose is the fact that nine of the ten tuberculous cases were acutely ill with fever and pulmonary cavities. All had tubercle bacilli in the

The cause of death in ten of the 12 fatal cases has been tuberculosis although coma was also present in three. Case No 6511 died of recurrent carcinoma of the breast. Metastases had almost destroyed the lungs completely. Case No 4287 died of coma alone.

Coma and Prognosis The duration of life of this group has been surprising. Case No 4232 is now in good condition at the age of 25 years with diabetes of 11.3 years' duration. Case No 7486 is alive in December 1932 at the age of 37 years with diabetes of 10.9 years' duration and tuberculosis of 4 years' duration. In fact the average duration of life after onset of diabetes in the 13 fatal cases of this group is 6.0 years and of the eight living cases figured to December 1932 is 6.9 years. With early diagnosis of the tuberculosis and reasonable control of the diabetes the results might be greatly improved.

4) REMARKABLE CASES

CASE No 5738 Although under the burden of great responsibilities he has demonstrated the conquest of combined diabetes and pulmonary tuberculosis for at least seven years. In December 1926 after having diabetes for nine years pulmonary tuberculosis was discovered. Bed treatment with a diabetic nurse was carried out for three months the tuberculosis being under the care of Dr James

A Miller. The sputum did not become negative for tubercle bacilli until June 25 1929 but it has remained free from bacilli since that time. In figure 1 is shown the first roentgenogram and table 2 summarizes briefly his diabetic record. Later x-ray reports made available through the kindness of Dr Miller are as follows—

The films dated December 6 1928 show the area in the upper portion of the right lung to be considerably smaller than on the first group of films described. This would indicate that there has been a gradual contraction in this area probably due to scar tissue. The fact that the circumscribed hazv area described on the right side just below the level of the seventh rib posteriorly has become more sharply outlined also is evidence of favorable progress. There is no evidence of cavitation in the left lung except on the first film.

July 16 1929 Cavity in right upper lobe has shrunken definitely.

The patient has gained 42 pounds in six years and the insulin has been increased from 15 to 50 units. Diet and urinary tests have been under the constant care of a diabetic nurse who has made reports regularly. As his weight has increased the fat in his diet has been decreased. In June 1933 his condition is at the optimum for recent years.

Juvenile Diabetes and Tuberculosis

CASE No 2274 until he was five years of age lived with his grandfather who died of pulmonary tuberculosis. Diabetes began the next year and insulin treatment was started two years later. Four years later at the age of 12 years extensive pulmonary



FIG 1. Case No 5738. Onset of diabetes July 1917 at age of 42 years. Pulmonary tuberculosis at 51 years. Cavity in left upper lobe. Involvement of upper third of right lung.

cium to the diet, which may be assumed to contain the remaining 0.6 gram calcium required.

d) *Restriction of Salt* The most recent innovation in dietary treatment of tuberculosis is the salt restricted diet advocated by Herrmannsdorfer, Gerson and Sauerbruch²⁸

Favorable results from such a diet have been reported especially in the skin lesions of tuberculosis, and foci in the mouth, palate and pharynx, as well as in exudative processes generally. Grote comments on its usefulness in treatment of carbuncles, edema, etc. Case No. 11023, male, aged 32 years at onset of diabetes in 1930, had an extensive pneumonic tuberculosis in both upper lungs. The salt-free diet was used for a brief period at the Deaconess Hospital in May, 1932. He was transferred to a sanatorium and was somewhat improved in January, 1933. No conclusions can fairly be drawn from our limited experience.

3) *Acidosis and Coma* Coma and tuberculosis frequently occur in the same patient, contrary to the old idea that coma was rare in the tuberculous diabetic. Hirsch-Kauffmann²⁹ describes the development of tuberculosis in a 16 year old girl who had coma more than once. Labbé³⁰ et al describes a woman whose diabetes began in pregnancy at 21 years of age. After two attacks of coma pulmonary tuberculosis involved both lungs requiring double pneumothorax. Rosenberg's³¹ case also treated by pneumothorax, after diabetes of 20 years' duration developed a fresh exudative process. Acidosis was severe, as indicated by urinary ammonia of five grams and beta-oxybutyric acid of 22 grams. Most striking is Bertram's³² statement from Munich that seven out of 13 deaths following recovery from coma and discharge from the hospital were due to pulmonary tuberculosis. Among 76 cases treated at the New England Deaconess Hospital with coma so severe as to be accompanied by a lowering of the plasma CO₂ combining power below 20 volumes per cent, six or eight per cent developed active pulmonary tuberculosis within three years. These cases left the hospital prior to Feb. 1, 1929. In later coma series sufficient time has not elapsed to allow a statement. The above does not fairly represent the frequency of acidosis and tuberculosis in the same patient. In addition to 21 cases of coma and pre-coma observed at the Deaconess Hospital who later developed tuberculosis, 16 cases had coma at home or in other hospitals. Thus among our 245 cases of pulmonary tuberculosis 37 or 15 per cent are known to have had coma. In ten cases coma was terminal. Ten per cent of 500 living non-tuberculous diabetic children have had coma at the Deaconess to which may be added an unknown number who may have had coma at home. This comparison is not entirely fair since many of our 245 tuberculous cases lived in the period before the discovery of

insulin but it emphasizes the fact of the frequency of acidosis in tuberculous diabetes. Case Nos. 2448, 2687, 4232 and 6287 had coma repeatedly at the Deaconess and Case No. 4287 twice at another hospital. In only three of the 21 cases was family exposure known. In 11 instances the sputum was known to contain tubercle bacilli. In five cases dying from tuberculosis we do not have positive data as to the sputum. Case No. 4232 spent two years in a state sanatorium with healing of a cavity. Case No. 6287 (Fig. 1, Chap. III, *New Eng J Med*, Jan. 18, 1934) had a minimal lesion without sputum. Case No. 8435 is also alive without a positive sputum. Two others died of coma and carcinoma respectively without a positive sputum. The types of tuberculosis varied. In Case Nos. 2448, 3143, 4763, 5932 and 7486 the roentgenograms indicated pneumonic processes with death following in two cases within a short period. Case Nos. 4232 (Figs. 6, 7 and 8, Chap. III, *New Eng J Med*, Jan. 18, 1934), 4763, 3775 and 7486 with cavitation did extremely well. Case No. 3775 gained 20 pounds in weight with partial healing of the cavity but died five years later probably of the tuberculosis although myocardial failure was a contributing factor. Case No. 2687 after repeated attacks of acidosis, developed a grippelike illness which after a period was proved to be miliary tuberculosis. Case Nos. 11006 and 6287 developed soft minimal lesions which in the case of 6287 apparently healed after six months in a sanatorium. Unfortunately after eight months at home with diabetes uncontrolled, in May, 1933, x-ray shows extension and she now has fever and a cough.

Chemistry of the Blood The average blood sugar on the first day of acidosis in 34 analyses was 0.41 per cent, whereas the average blood sugar in the last 42 cases of coma at the Deaconess Hospital averaged 0.47 per cent. Similarly the average plasma CO₂ in 26 cases was 19 volumes per cent in contrast with the average of 12 in 42 non-tuberculous coma cases. The acidosis was less severe in the tuberculous group. Renal function was so seriously disturbed in Case No. 4232 that anuria was present for 24 hours and the non-protein nitrogen of the blood rose to 139 milligrams. In five other cases slight degrees of nitrogen retention occurred.

The plasma lipids were determined in but few instances. Case No. 2448 had an abnormal increase in lipids in three attacks of coma. In the last, when acidosis was mild, the tuberculosis was far advanced and the plasma cholesterol was but 150 mgs. He developed hypoglycemia overnight with but 40 units of insulin and the plasma cholesterol fell to 90 mgs the next morning. Case Nos. 4232 and 6511 also had moderate increases in plasma cholesterol during coma.

The average insulin dose in tuberculous coma cases was 130 units as compared with 201 units for 42 non-tuberculous cases.

ent, and the sputum was positive. Insulin was begun in 1924 at the Deaconess Hospital with 30 units daily. Roentgenogram taken September, 1930 is shown in figure 2. In 1933 she now coughs very



FIG 2 Case 10163 F. Aged 34.8 years June 1931. Pulmonary tuberculosis began at 15 years when she spent three years in a sanatorium. Onset of diabetes at age of 22 years. Multiple cavities and a positive sputum during treatment at Boston Hospital at Mattapan at age of 26 years. Does own housework in 1935.

little looks extremely well and does her own housework.

Diabetes of Long Duration and Quiescent Tuberculosis

The record of CASE NO 1257 represents a régime faithfully carried out by a patient who had active pulmonary tuberculosis at the age of 30 years with occasional mild recrudescences in later years survived 25 years of diabetes and died at the age of 70 with coronary thrombosis and a perforated duodenal ulcer. Insulin was begun in 1923 and continued to the end. Her diet provided 30 calories per kilogram and she gained 14 pounds during the last five years of her life. At autopsy apical tuberculosis was practically healed.

TREATMENT OF TUBERCULOSIS. GENERAL CONSIDERATION. The treatment of the tuberculous process in a diabetic patient should be governed by consideration of the same principles as in a non-diabetic, adjusted however, to the fact that the diabetic in general is more susceptible to a breakdown if the diabetes is not under constant control, has a lower resistance and therefore should in case of doubt be given the most conservative advice.

The greatest advance in the treatment of tuberculosis has been due to an increasing appreciation of the rôle of rest in bed. The value of rest in quieting the symptoms of tuberculosis is now generally recognized, but if the process is to remain arrested, a prolonged period must be allowed for almost complete healing to take place.

The diagnosis of pulmonary tuberculosis in a diabetic is usually made so late in the course of the disease that exposure of other members of the family and the existence of active disease in the family are highly probable. As physicians our duty to the family has just begun when the diagnosis in one member is made.

Thorough examinations of every other member, including an x-ray, are indicated. In six out of ten diabetic children family contact was known. In Case No 5932 the father, mother and five brothers and sisters were negative to examination and x-ray but the boy's employer was found to have tubercle bacilli in his sputum!

a) *Sanatorium vs Home.* For the diabetic patient the problem of home treatment versus institutional treatment seems a difficult one. Sanatorium treatment in the past has frequently not been urged because the diagnosis of pulmonary tuberculosis has so generally been made when the disease had reached a terminal stage. The physician under those circumstances has frequently yielded to the desires of the patient to die at home in spite of the danger to other members of the family. In only a minority of cases will home treatment be effective. Taking the cure is like finding "a way of life" and that way is particularly hard for the patient to follow at home. If there is nothing more to the treatment than bed-rest reasons the patient, he might better be at home. If he has a good home, that might be true but the point he overlooks is that, in addition to bed-rest, there are details one learns from physicians, nurses and other patients, the force of example, and common routine. A period of quiet and of relative isolation helps the patient to regain his composure, after having been upset by the news that he has tuberculosis. He needs freedom from disturbance by family, friends and business. In the diabetic even more than in the non-diabetic the mental comfort and confidence of the patient are of great importance. The news that tuberculosis has developed often comes to the diabetic who has struggled for so long with a chronic disease like a final blow. In order to provide relief from the suffering which this knowledge brings and to bring him into such a frame of mind as will be conducive to carrying out a successful period of sanatorium treatment most serious and sympathetic consideration must be given to his problem. The most cheering fact is that sanatorium treatment has so greatly improved the duration of life and comfort of the tuberculous patient. Dublin²² points out that the end results of sanatorium treatment are similar no matter what the location of the institution. The results of the best sanatoria show that among their graduates that is patients discharged as arrested or improved, the mortality is from two to three times the normal for age. Those in a moderately advanced stage of the disease have a mortality eight to ten times the normal for age. Tuberculous individuals as a whole have mortality 14 to 15 times the normal for age. Sanatoria therefore convert incipient cases into a group dying at the rate of only two to three times normal, mod-

TABLE 2

CASE No 5738 Age at onset of diabetes 42 4 yrs Date July 1917
Age at onset of tuberculosis 51 yrs Maximum wt. 162 net.

Date	Weight Lbs	C	Diet P F Cals	Insulin Units	Blood Sugar Per Cent	Urine Sugar Diac.	Notes
1924 Sept. 1						3 0	
1926 May Dec	122	96	68 144 1960	15	0 18 0 17F	0 7 0 2 0	Began insulin X rays. Sputum positive
1927 May 30 Oct. 3 Nov 15	140 142 145	165 180 177	68 130 2102 75 115 2055 75 110 1998	18 15 19	0 15 0 14	0 0 0 0 0 0	Cough 1½ tsp red blood
1929 Feb 26 Oct. 15	136 150	160 148	75 90 1750 64 100 1799	32 32	0 15	tr 0 0	No râles
1930 Sept	160	154	68 95 1700	43		0 1 0	Urinary nitrogen 7.9 Gm. Working at office
1931 Dec. 20	164	160	75 70 1570	50		0 7 0	Working at office
1933 May 26	163			50	0 22		No cough

tuberculosis was found. In Table 3 it is seen that in four years ending July 14, 1931 he gained 24 pounds and grew nine inches. Figure 9 (Chap III, *New Eng J M*, Jan 18, 1934) shows the roentgenogram of July, 1931. The carbohydrate of his diet has been increased steadily as well as the insulin. He has lived at home under the care of Dr Emery of Portland, Maine.

Juvenile Tuberculosis and Diabetes Developing Later

CASE No 10163, female, developed pulmonary tuberculosis in 1911 at 15 years. In 1918 at the Massachusetts General Hospital diabetes was discovered when she had a miscarriage. In 1922 at the Boston Hospital for consumptives multiple cavities were pres-

TABLE 3

CASE No 2274 Age at onset of D M 6 yrs Date January, 1921
Age at onset of tuberculosis 12 yrs

Date	Weight Lbs	C Gm	Diet P F Cals Gm Gm	Insulin Units	B S Per Cent	Urine Sugar Diac.	Notes
1921 July 12	41	70	70 47 993			tr	Ht 4 ft
1923 May	46	59	48 86 1202	5		0 2 0	
1925 July	69			20		0	
1927 April	69	70	67 80 1268	32		4 0	Ht 4 ft. 6 in X ray Tbc. both apices right middle and left lower lobes
1928 Aug 6	75	88	70 97 1503	35	0 25	0 8 0	Ht. 4 ft. 8 in
1929 June		101	66 98 1550	36			Pulmonary hemorrhage
1931 July 14	93	140	81 102 1802	54	0 10	0 0	X ray atelectasis of left lung Upper half lung —old chronic tubercu- losis Ht. 5 ft. 3 in

eated by scars, fibrous strands and calcification, is rather low, suggesting that when re-infection occurs in a diabetic it is apt to go on to an acute form with fatal ending or into a chronic but not arrested form. Exceptions are frequent. It is clear that diabetes in no sense renders arrest and healing impossible. Their apparent infrequency teaches the importance of discovering tuberculosis early and giving adequate treatment in the stage where a real arrest may be expected.

d) *Occupation* The occupation of the diabetic must be carefully chosen. Nursing is out of the question for the diabetic girl because it is too strenuous as well as almost certainly exposing her to the contagion of tuberculosis. Similarly it is doubtful whether the study of medicine should be pursued by a diabetic. An outdoor occupation and one which provides sufficient opportunity for extra rest when needed is desirable. A diabetic needs exercise.

B PROGNOSIS The prognosis for the diabetic patient with tuberculosis was considered practically hopeless before the use of insulin. It must be remembered, however, that all statements in the past have been based upon tuberculosis discovered in an advanced state. *One rarely finds in the tremendous literature on the association of these diseases records indicating that tuberculosis has been recognized in an incipient stage in a diabetic.* Grillo⁶¹ recently referred to three incipient cases in New Haven. At present prognosis is distinctly improved by the efficiency of insulin and modern

The delay in the diagnosis of tuberculosis is not to be charged solely to delay on the part of physicians. Williams and Hill⁴⁹, studying a series of 1499 non-diabetic patients found that 24 per cent waited from one to 20 years after the first symptom before consulting a physician and only one in three consulted his doctor within a month after symptoms began. Only 12 per cent of this series were classified as minimal on admission to the sanatorium. This percentage is still three times as great as among our diabetics.

Delays on the part of physicians in making the diagnosis of tuberculosis among diabetics are probably greater than Williams and Hill reported for non diabetic tuberculosis. In their series at least 43 per cent were diagnosed tuberculous within a month of the first visit. A discouraging fact is brought out in table 4. The duration of tuberculosis in fatal cases appears no greater in the later period than in the earlier period although the duration of the diabetes has doubled. This means that the diagnosis of tuberculosis is not being made any earlier. It is fair to say that in the past, because the combination appeared so hopeless to the physician, often the patient was treated without being told that he had tuberculosis.

The favorable course of cases diagnosed early is best illustrated by the juvenile cases. Of this group three have lived from five to ten years after active pulmonary tuberculosis was discovered. Two deaths occurred after diabetes of ten years' duration. In Case Nos 4232 and 2179 large cavities have healed. Case No 6287 has

TABLE 4
DURATION OF DIABETES AND PULMONARY TUBERCULOSIS IN 160 FATAL CASES

Period	Number of Cases	Diabetes Years	Tuberculosis Years	Total Diabetic Deaths	Per Cent Tuberculosis
1898-1914 Aug 7	18	5.6	2.2	342	4.7
1914-1922, Aug 7	46	4.9	3.3	805	5.7
1922-1931	96	7.6	3.0	1503	6.6

dietary treatment in preventing deaths from coma and in maintaining better nutrition. An additional factor is the use in properly selected groups of surgical procedures such as collapse therapy.

The hope for the future of diabetic tuberculosis lies in earlier diagnosis. Emerson⁴⁸ points out that in New York City one-half of the cases of active tuberculosis are not known and 29 per cent are not reported until within one week of death, and 53 per cent are under no kind of real supervision. Among our 245 diabetics, 25 cases (10.2 per cent) died within two months of the diagnosis. In only ten cases (4 per cent) have we discovered the disease while the lesion was still minimal. These facts serve merely to emphasize the tardiness of diagnosis

shown healing of a subclavicular lesion. Similarly Wessler and Hennell⁵⁰ report from New York City eight cases of diabetes and pulmonary tuberculosis, in seven of whom cavities healed during observation. These cases clearly prove that early diagnosis will result in astonishingly favorable results in diabetics as well as in non-diabetics.

1) EFFECT OF INSULIN UPON PROGNOSIS Fatal cases treated with insulin lived 8.9 years and those treated without insulin lived 5.9 years after onset of diabetes. Among the insulin-treated cases alive in 1933, active pulmonary tuberculosis has been present in 18 patients for more than 5 years, the average being 9.0 years. The prognosis for pulmonary tuberculosis in a diabetic may be better than in a non diabetic.

erate cases to a group with eight to ten times normal mortality instead of 14 times normal. Never before have so many diabetics been treated in sanatoria. In 1932, at one of the Connecticut State Sanatoria, Uncas-on-Thames⁸⁴, eight cases were under treatment at one time. McKean⁸² has studied 73 cases from the Herman Kiefer Hospital, Detroit, for periods from 6 months to 45 years. In January, 1934, fifty are still living, of whom 21 are still in the institution. In 23 the tuberculosis had become inactive.

We recommend sanatorium treatment immediately for any diabetic patient with active pulmonary tuberculosis and believe that the improved duration of life of certain cases during the last ten years has been due to the greater frequency with which sanatorium treatment has been accepted as well as to the help given by insulin.

Treatment of patients, who present definite evidences of pulmonary tuberculosis by x-ray but no history of any illness to explain it, consists of careful watching with repetition of the x-rays at intervals, but no restriction of their activities except the maintenance of good hygiene. Nutrition must be maintained by a diet sufficient in calories and with insulin dosage sufficient to control glycosuria and to maintain body weight and strength.

b) *Collapse Therapy* The use of artificial pneumothorax in diabetic cases has increased rapidly. Villaret et al⁸⁵ describe a boy of 17 years whose first symptoms of tuberculosis began insidiously. At 18 years of age he entered the hospital with acidosis. Cavities were present in the left lung and the sputum was positive. He received insulin 75 to 140 units a day. Pneumothorax was performed in June, 1926. One year later he had gained 18 pounds and was free from fever. In December, 1928 he had severe acidosis and required from 280 to 310 units of insulin a day. The sputum was free from tubercle bacilli. He was then given treatment with double thiosulphate gold and sodium with unfavorable results. He lost weight. Tubercle bacilli returned in the sputum. This case illustrates the increasing doses of insulin required with an advancing case of tuberculosis.

Labbé³⁰ reported two cases observed for three years and one observed for four years. In the last case the patient had diabetic coma three different times and three times presented acute pulmonary symptoms. With the pneumothorax on the left side and a phrenicectomy she was able to lead a nearly normal life at the time of the report in December, 1930.

Le Noir and Scherrer³⁷ have described a juvenile diabetic in whom healing occurred under treatment with insulin and pneumothorax. Their boy was 19 years of age and had a positive sputum. His mother was tuberculous. Pneumothorax was performed in 1926. In De-

cember, 1928 he was taking 140 300 units daily and weighed 140 pounds. He had had one cataract which disappeared. The pneumothorax was still maintained and he had received a total of 132,000 units of insulin.

Hart and Creel³⁸ describe a case in whom artificial pneumothorax performed in 1919, was followed by hydropneumothorax and one year later by empyema. Under treatment by instillation of gentian violet, he improved. However, in 1923 the sputum contained tubercle bacilli, three cavities were present and in March, 1923, he required 278 units for recovery from coma. Jacobson³⁹ describes two sisters with pulmonary tuberculosis and diabetes, both treated by pneumothorax, an outstanding example of the effects of heredity and contagion. Roles⁴⁰ case, an army officer, 30 years of age, also hereditary, had a lesion under the right clavicle of the "früh infiltrat" type. Pneumothorax gave improvement.

Geer's⁴¹ case required an emergency pneumothorax to control severe recurring hemoptysis. The hemorrhages ceased after the third filling. Diabetes had been discovered only five months after onset of tuberculosis.

Blum⁴², Dorendorf⁴³, Bernard and Salomon⁴⁴, Curschmann⁴⁵, and Ameuille⁴⁶ describe patients in whom treatment by diet and pneumothorax has given good results.

Several of our cases have had treatment with pneumothorax or thoracoplasty which, however, was performed in tuberculosis sanatoria. Case No. 8922 under treatment at the Essex County Sanatorium had received six injections of air and in July, 1931 at the age of 27 years was free from fever, had no sputum. In January, 1933, the diabetes was in such excellent condition that she had been able to omit insulin and taken an unlimited diet.

Arrest On account of its latency and the comparative freedom of symptoms when a patient is at rest the determination of arrest or healing may be most difficult. The lack of constitutional symptoms should receive little consideration. Physical signs, especially râles, are of little value in determining progression and retrogression of a tuberculous lesion. There is increasing agreement that the Roentgen ray must be considered the main reliance in determining an arrest or a healed lesion. When, by the comparison of serial roentgenograms at quarterly intervals, a lesion is found hard and fibrosed, and it has remained stable for six months, Fales⁴⁷ considers that an arrest has been attained, provided an additional six months is passed with carefully graduated exercise and observation without reactivation of the disease.

The diabetics studied routinely at the Deaconess Hospital have shown calcified primary tuberculosis in 75 per cent of the cases. The incidence of old healed apical tuberculosis, indi-

cated by scars, fibrous strands and calcification, is rather low, suggesting that when re-infection occurs in a diabetic it is apt to go on to an acute form with fatal ending or into a chronic but not arrested form. Exceptions are frequent. It is clear that diabetes in no sense renders arrest and healing impossible. Their apparent infrequency teaches the importance of discovering tuberculosis early and giving adequate treatment in the stage where a real arrest may be expected.

d) *Occupation* The occupation of the diabetic must be carefully chosen. Nursing is out of the question for the diabetic girl because it is too strenuous as well as almost certainly exposing her to the contagion of tuberculosis. Similarly it is doubtful whether the study of medicine should be pursued by a diabetic. An outdoor occupation and one which provides sufficient opportunity for extra rest when needed is desirable. A diabetic needs exercise.

B PROGNOSIS The prognosis for the diabetic patient with tuberculosis was considered practically hopeless before the use of insulin. It must be remembered, however, that all statements in the past have been based upon tuberculosis discovered in an advanced state. *One rarely finds in the tremendous literature on the association of these diseases records indicating that tuberculosis has been recognized in an incipient stage in a diabetic.* Grillo⁶¹ recently referred to three incipient cases in New Haven. At present prognosis is distinctly improved by the efficiency of insulin and modern

The delay in the diagnosis of tuberculosis is not to be charged solely to delay on the part of physicians. Williams and Hill⁴⁹ studying a series of 1499 non-diabetic patients found that 24 per cent waited from one to 20 years after the first symptom before consulting a physician and only one in three consulted his doctor within a month after symptoms began. Only 12 per cent of this series were classified as minimal on admission to the sanatorium. This percentage is still three times as great as among our diabetics.

Delays on the part of physicians in making the diagnosis of tuberculosis among diabetics are probably greater than Williams and Hill reported for non-diabetic tuberculosis. In their series at least 43 per cent were diagnosed tuberculous within a month of the first visit. A discouraging fact is brought out in table 4. The duration of tuberculosis in fatal cases appears no greater in the later period than in the earlier period although the duration of the diabetes has doubled. This means that the diagnosis of tuberculosis is not being made any earlier. It is fair to say that in the past, because the combination appeared so hopeless to the physician, often the patient was treated without being told that he had tuberculosis.

The favorable course of cases diagnosed early is best illustrated by the juvenile cases. Of this group three have lived from five to ten years after active pulmonary tuberculosis was discovered. Two deaths occurred after diabetes of ten years' duration. In Case Nos 4232 and 2179 large cavities have healed. Case No 6287 has

TABLE 4
DURATION OF DIABETES AND PULMONARY TUBERCULOSIS IN 160 FATAL CASES

Period	Number of Cases	Diabetes Years	Tuberculosis Years	Total Diabetic Deaths	Per Cent Tuberculosis
1898-1914 Aug 7	18	5.6	2.2	342	4.7
1914-1922 Aug 7	46	4.9	3.3	805	5.7
1922-1931	96	7.6	3.0	1503	6.6

dietary treatment in preventing deaths from coma and in maintaining better nutrition. An additional factor is the use in properly selected groups of surgical procedures such as collapse therapy.

The hope for the future of diabetic tuberculosis lies in earlier diagnosis. Emerson⁴⁵ points out that in New York City one-half of the cases of active tuberculosis are not known and 29 per cent are not reported until within one week of death, and 53 per cent are under no kind of real supervision. Among our 245 diabetics, 25 cases (10.2 per cent) died within two months of the diagnosis. In only ten cases (4 per cent) have we discovered the disease while the lesion was still minimal. These facts serve merely to emphasize the tardiness of diagnosis

shown healing of a subclavicular lesion. Similarly Wessler and Hennell⁵⁰ report from New York City eight cases of diabetes and pulmonary tuberculosis, in seven of whom cavities healed during observation. These cases clearly prove that early diagnosis will result in astonishingly favorable results in diabetics as well as in non-diabetics.

1) **EFFECT OF INSULIN UPON PROGNOSIS** Fatal cases treated with insulin lived 8.9 years and those treated without insulin lived 5.9 years after onset of diabetes. Among the insulin-treated cases alive in 1933 active pulmonary tuberculosis has been present in 18 patients for more than 5 years, the average being 9.0 years. The prognosis for pulmonary tuberculosis in a diabetic may be better than in a non-diabetic.

In table 4 it appears that pulmonary tuberculosis is more frequent now than before the discovery of insulin. In fact, the figures probably err in not giving the full number of tuberculous patients because relatively so many more tuberculous patients survive the disease for long periods than was true in the period before 1922.

The important fact, however, is that on the average diabetic patients before 1922 lived only half as long as they do now and died so much more often with coma. The added years of living increase the chances of contact with active cases and therefore of re-infection. The chances of contact with active cases are multiplied by another factor, namely that the diabetic patient of today is by virtue of insulin treatment, vigorous, active and taking a part in the life of his community so that his opportunities for contact are greater than were those of his diabetic ancestor who huddled the fireside and ceased to take an active part in community life shortly after his diabetes began. The prognosis for the development of tuberculosis by diabetic patients is evidently much worse in the out-patient clinics of the great European cities than it is in the United States. Labbé⁶¹ in reporting a year's observation of diabetes in Paris notes that 24.3 per cent of the 37 deaths were due to pulmonary tuberculosis.

In the next few years tuberculosis as a complication of diabetes will be seen more frequently. More frequent use of x-rays with earlier diagnosis, general prolongation of life and the increasing incidence of diabetes in the community may outweigh the importance of improved diabetic treatment, and the reduction of contacts in the community brought about by the falling death rate and the more frequent hospitalization of active cases of pulmonary tuberculosis.

2) *Prognosis as Affected by Advanced Stage of the Tuberculosis* From table 4 it appears that the lack of improvement in the average duration of the pulmonary tuberculosis may be explained in two ways. Since 1922 better diabetic treatment may simply have postponed the onset of tuberculosis. If it be true, then better diabetic treatment should also prolong the course of the tuberculosis. This certainly seems true in a number of cases, yet the average duration shows an increase only from 2.2 to 3.0 years. The second explanation for the constancy in duration of life after onset of tuberculosis is that the diagnosis of tuberculosis is still made in the vast majority of cases when the condition is well advanced and the prognosis is then relatively little affected by the use of insulin.

A comparison with other diabetic series shows how quickly fatal a complication tuberculosis has been. Among Fitz⁶² cases 63 per cent died within a year of diagnosis. Twenty-three per cent lived only from one to three years and 13 per cent lived for three years. Of Banyai's⁶³ 31

cases ten died in the sanatorium, ten were unimproved by treatment, five improved, two became quiescent, and four were apparently arrested. Wassmund⁶⁴ analyzed 60 cases occurring among 8,000 sanatorium patients. In 40 days he noted that the diabetes improved in 98 per cent, but became worse in 23 per cent. However, the tuberculosis improved in 72 per cent of his cases. None, however, became capable of full-time work and only 38 per cent were able to do a limited amount of work. His cases were severe cases, 37 per cent were progressive, 12 died during treatment, three of coma, four of hemoptysis, two of tuberculous meningitis, and two of gangrene of the lung.

3) *X-RAY FINDINGS AND PROGNOSIS* Calcified tracheobronchial nodes in children indicate severe infection in the past. Usually they mean close contact with an open case. Diabetic children with calcified glands must be separated from contact with an open case and must live under conditions which will provide for adequate rest and diet. They probably should have x-ray films repeated at the thirteenth and sixteenth years. Among our 286 diabetics 42 per cent in the first decade and 74 per cent in the second decade studied by x-ray have had calcified tracheobronchial glands and from this group have already developed four cases of parenchymal tuberculosis.

The finding of calcified glands or calcified areas in the parenchyma, indicating areas of tuberculous infection which have undergone healing is sometimes interpreted as advantageous to the patient. It is easy to stress the immunity conferred by a primary infection which apparently is healed, but the degree and duration of such immunity are, to say the least, uncertain. How much immunity is acquired with the development of allergy is entirely unknown. Whether such immunity is of less or greater importance than the native defensive factors of the individual cannot be determined. So far in no diabetic have we found active tuberculosis without such areas of calcification. If these earlier infections acted solely in a protective manner and never as foci of later activity, some cases without such evidences of old foci should occur.

Dense pleural thickening, whether widespread over the lower lobes or localized in the interlobar fissure, suggests tuberculous infection and may precede or accompany tuberculous infiltration. Thus Case No. 4045, a physician, aged 61 years, in August, 1924 had dense pleural thickening over the lower half of the left lung with an old area of calcification in the parenchyma. Within six weeks he developed miliary tuberculosis and died. On the other hand, the slight sharp interlobar lines between the right middle and upper lobes are easily seen and frequently have little significance even in childhood. McPhedran⁶⁵ says that in white children dense

pleural thickening associated with even diffuse tuberculous infiltration may clear up rapidly and leave no trace

Atelectasis has occurred in a few of the diabetics notably Case Nos 2274 (See fig 9, Chap III *New Eng J Med*, Jan 18, 1934) and 10163. The collapse of the lung with a displacement of the mediastinum appears more menacing than it really is because as Strelman⁵⁵ recently noted, atelectasis is often produced by a rather minor lesion and has a correspondingly favorable prognosis

OTHER FACTORS Age affects the prognosis materially. In the young, tardy diagnosis results in short duration of life. Arteriosclerotic complications affected the course in the 49 cases with onset of diabetes after the age of 60 years. The average duration of life after onset of diabetes in 36 fatal cases in the latter group was 8.0 years. Case No 8643 was omitted from this average because of exceptional duration of diabetes, which would have increased the duration of the group to 9.3 years. The average duration of the tuberculosis in this group was less than one year. Analysis of their records showed these were not cases of acute tuberculosis, but represented terminal stages of chronic tuberculosis.

Sex appears of unexpected importance. Three-fourths of all our cases in this series were males. The type of onset helps but little. In general cases which have begun most stormily with high fever, toxemia and extensive lesions have had the worst prognosis. Cases with more insidious onset have done more favorably. Case No 6627, male, aged 19 years at discovery of tuberculosis had a most insidious onset and yet progressed rapidly to death within two years. Undoubtedly the most important factor in prognosis is the stage of the tuberculosis at the time it is discovered. Cases with small lesions localized, who can be given adequate treatment with rest in bed for a period of months and who are carefully followed both with respect to the diabetic and tuberculosis régime, do well. Case No 4845 developed tuberculosis at the age of 25, spent a year in a sanatorium, diabetes developed at the age of 51 years. In 1928 she had a fresh minimal lesion which however, has made little or no progress. In December, 1932 she writes that she is in good health.

The severity of the diabetes is most difficult to evaluate as a factor in prognosis. Certainly cases not controlled by adequate treatment are more likely to develop tuberculosis as indicated by the incidence of tuberculosis in coma cases. Rosenberg and Wolff noted that only three of their 40 cases developed tuberculosis during well-managed insulin treatment. I can only recall two such cases, a child, whose mother had tuberculosis, and a woman of 77 years. Case No 1977 who developed tuberculosis while under observation in a hospital for nearly two years

prior to death. Severe cases, requiring 50 units of insulin or more daily may do well as illustrated by Case Nos 4763 and 5932. Sansum⁵⁷ reported three cases receiving 96, 105 and 134 units of insulin daily who improved markedly in spite of extensive tuberculosis. Three of Nadler's⁵⁸ six cases became quiescent. Even after the development of progressive tuberculosis nearly all diabetics, if carefully treated, may become mild.

C) PREVENTION

1) Avoidance of contact with open cases of tuberculosis must be brought about by the discovery and isolation of such cases in the family of diabetic patients.

2) Good hygiene must include adequate rest, fresh air, outdoor life so far as possible, regular exercise, and pasteurized milk. Summer camps are of great value for diabetic children. In the summer of 1932, 92 diabetic children spent from two to eight weeks in four camps in New England. With specially trained diabetic nurses and medical supervision, they were able to reduce the insulin dose and to increase their diets indicating improvement in the diabetes. Children with positive skin tests and calcified glands, who form the majority of the diabetic children in the second decade of life especially need such opportunities.

3) Early use of insulin, an adequate diet and constant control of the diabetes are fundamental in maintaining the best nutrition and resistance.

4) More frequent examination of the lungs by x-ray is necessary in order that early tuberculous lesions may be discovered when adequate treatment will permit healing to occur. In children with known contact and positive skin tests x-rays should be repeated at the thirteenth, sixteenth and twentieth years.

5) The use of anti-tuberculosis vaccination is at present in an experimental stage. At some time it may prove valuable to the diabetic.

CHAPTER IV

SUMMARY

1) In order to promote good nutrition and resistance to tuberculosis, the use of insulin should be begun immediately in all youthful diabetics.

2) Considering age, weight and diet the tuberculous diabetic required about the same insulin dose as the non-tuberculous case. The average daily dose in 18 cases of tuberculosis and diabetes at the Deaconess Hospital between the ages of 15 and 29 years was 39 units.

3) Serious hypoglycemia must be guarded against by the cautious use of insulin in severely ill, or emaciated tuberculous diabetics.

4) Sixty-nine fatal cases of tuberculosis and

diabetes treated with insulin lived 86 years, whereas, 90 fatal cases treated without insulin lived only 54 years after onset of diabetes

5) The last ten cases of active tuberculosis and diabetes with fever at the Deaconess Hospital received an average diet of carbohydrate 157 grams, protein 83 grams, fat 116 grams, calories 2004 and insulin 42 units

6) Twenty-one cases of acidosis and coma later developing tuberculosis are described. Coma cases should be followed up yearly by x-ray examination for the detection of developing tuberculosis

7) Three cases remarkable for long duration of diabetes and advanced tuberculosis are described. Eighteen cases alive in 1933 have survived active pulmonary tuberculosis for an average of 90 years

8) The recognition of pulmonary tuberculosis in a truly incipient stage in a diabetic is almost unknown in the literature. Ten cases occur among 245 in this series

9) Prognosis for the tuberculous diabetic depends upon earlier diagnosis of the tuberculosis by more frequent physical and x-ray examination

10) Advantages of sanatorium treatment and the use of collapse therapy are summarized

11) The modern prolongation of life of the diabetic and his greater entrance into general activities expose him to tuberculosis and may result in a greater incidence of tuberculosis among diabetics

12) Lack of control of the diabetes increases the chance of developing tuberculosis, as indicated by the frequent development of tuberculosis in cases who have had coma

13) Preventive measures include early aggressive diabetic treatment, and good hygiene

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THE APPLICATION OF PSYCHOANALYTIC CONCEPTS
TO GENERAL PSYCHOTHERAPY

BY MARTIN W PECK, M.D.*

SOME thirty years ago, Professor Sigmund Freud originated a method for investigation of the human mind which made it possible for science to cross hitherto impassable barriers. Before the work of Freud and a few of his contemporaries who share his honors, the scientific world was in touch only with that conscious part of the mind of man which has now proved to be little more than the imposing façade to a vast mental edifice.

In the past, the majority of investigators were satisfied that this façade sufficiently revealed the main structure. Others, more curious, gazed into the dim shadows and speculated on what hidden chambers might lie beyond. The helplessness of science did not mean that this field was wholly untouched. The intuitive powers of the specially gifted among men, outstandingly the poets, were responsible for deep but sporadic penetrations. The results, however, could only be expressed in the language of art, which lacks that objectivity required for science. Similar inadequacies applied to the theoretical constructions of the philosophers who, in their own fashion attempted to reveal this obscure region.

The so-called scientific method for the investigation of phenomena, with its strict objectivity, has brilliantly justified itself through the knowledge and control it has given of the physical universe. Naturally, it has been jealously guarded against any modifications which might savor of the superstition and inaccuracies of the prescientific age. In the method called psychoanalysis, Freud retained the objective approach, but the nature of his particular field of interest did not permit mathematical accuracy or experimental verification. He therefore made some radical departures in research procedure which brought his whole system under immediate suspicion by the scientific world. It is fair to say that in the years since its birth, the Freudian method has gradually emancipated itself from charges of heresy, and in its own domain has become increasingly acceptable to science.

The results which have come about through the use of the Freudian method mark as sharp a distinction between old and new knowledge of the mind as that which took place in the knowledge of the body following the discovery of the microscope. Psychoanalysis has made possible a kind of psychic histology of the mind to supplement the gross anatomy of the pre-Freudian period. The vast mental regions which

lie outside of consciousness have been discovered and, in part, explored. These regions of the unconscious mind are inaccessible to the direct approach which, before psychoanalysis, was the only road which science considered useful or even respectable.

The psychoanalytic method has developed in two directions: first, and most important, it is a means of research into matters of the mind and has resulted in a growing body of data empirically obtained; secondly, for certain mental pathologies, it offers a means of therapy which holds the unique position of being a practical application of research itself, that is, the self-knowledge gained by the subject from these psychoanalytic studies carries high potentials for self-cure. As a method of research, psychoanalysis has wide application in medicine and other fields. As a method of therapy it is more restricted, and applies chiefly to a selected group of psychoneuroses. Psychoanalysis has been called the major surgery of psychotherapy, and in many ways the analogy holds good. Like surgery, it is often a method of choice for conditions not modifiable by more simple methods. Like surgery, it is neither necessary nor desirable for general application. Like surgery, again, it is limited in its scope and cannot do the impossible.

This major surgery of the mind must obviously be done by those specially trained in its technique, but psychotherapy in general plays too large a part in medical treatment ever to be monopolized by specialists, psychoanalytic or otherwise. The majority of such work will always be done by practitioners in every field, with the family physician in the lead. The logic of medical progress demands that with the new knowledge of mind made possible by psychoanalysis this therapy be employed by the physician with new understanding and skill. His intuitive art, which has been a chief resource in the past, can now be reorganized and extended by the acquirement of a more standardized technique. In psychotherapy history may well repeat itself. The physician of old had a small stock of knowledge about the human body and supplemented this with an intuitive skill often far-reaching in its scope. The rapid development of medical knowledge in the past century resulted in increasingly specific methods of treatment which must be learned by technical training and can never be attained by the process of intuition. During the period just ahead there may be predicted some similar evolution in the field of psychological medicine. In

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coming generations the physician untrained in the psychotherapy which he practices should be as rare as the one who is unfamiliar with asepsis or who prefers the palm of his hand to a clinical thermometer

The psychotherapeutic resources of the future are likely to be eclectic ones, varying according to need and opportunity. In spite of some over-enthusiastic claims, psychoanalytic therapy by no means makes obsolete the methods of the past. The psychotherapy that was effective before psychoanalysis was developed remains effective today. Much of former psychotherapy was simply an incidental and automatic accompaniment of some physical therapy and operated in complete obscurity, hidden alike from physician and patient. The preanalytic methods which were used deliberately, so far as they can be classified, are as follows. First, suggestion (both in the waking and hypnotic states), which by various short cuts attempts to substitute ideas of health for those of illness. Secondly, persuasion, which is suggestion supplemented by appeal to the intellect and the powers of logic. Thirdly, reeducation, which is persuasion plus the attempt to give the patient a deeper understanding of his own psyche, and to teach him a better way of life. Fourthly and fifthly, are inspiration and consolation, which explain themselves. Between these different methods there are no hard and fast lines, and fundamentally they all have important features in common*.

A somewhat special variety of psychotherapy is what Janet calls directorship. In directorship, the physician assumes, or better, is given by the patient something of a god-like rôle, so that in any perplexity there is someone to whom he can turn whose strength seems omniscient and judgment infallible. By the aid of such a relationship to a stronger personality in a position of authority, certain dependent personalities can live in peace rather than in turmoil. There are few physicians, or those in other professions, for that matter, who have not among their clientele people who seek them out in any difficulty and are supported by this directorship. As so many of these difficulties concern matters of physical or mental health, the physician is the director par excellence. Certainly this is a legitimate function and the most that can be done for certain patients. However, it should not be too much to ask that the dispenser of directorship deliberately choose this relationship as the best under the circumstances rather than stumble onto it by chance and not be clearly aware of what is going on.

*The immense power for mental healing contained in religious faith should not go unmentioned in a discussion of psychotherapy. It does not however come within the province of medicine at the present time. Whatever the future may have in store is unknown but up to date it is true that the development of science has taken away from religious healing rather than added to it.

The thesis of this paper is concerned with what eclectic psychotherapy can borrow from psychoanalysis to its advantage, and more specifically, what practical applications can be made of psychoanalytic concepts to the older methods. A brief sketch of present day psychoanalytic theories of the human personality and the purpose and procedure in psychoanalytic treatment will be useful as an introduction.

OUTLINE OF PSYCHOANALYSIS

(A) *Theoretical Formulations*

Psychoanalysis began as an opportunistic method for treating nervous disorders, and incidentally revealed new and important data concerning the mind. On this data as foundation theoretical constructions have been formed, as is legitimate in any scientific discipline. Certain general principles, early discovered by Freud, appear to be fundamental and unchanging, but the theoretical superstructure is not static and will be modified in the future as it has been in the past.

Psychoanalytic psychology takes for its basic postulate that the source of psychic energy is found in certain *drives* or instincts. These instincts mark the dividing line between the biological and the psychological phases of the human organism. They originate in the organic activity of the body, but at one level of their functioning furnish the elemental stuff of the mind. In other words, the psyche of man represents activities, on a special plane, of driving forces which are fundamentally biological in their origin. To avoid confusion and for other pragmatic reasons, psychoanalytic concepts were, at least until recently, kept well within the limits of this psychological plane. The manifestly desirable tie up of the human organism into a psycho-biological whole was left for the future.

Human instincts in their mental manifestations can be usefully divided into two main groups. First, the sexual, and secondly, the aggressive. The sexual instincts furnish the binding forces in human relations*. From them is derived all love, filial, romantic, family, and social. They tend to form new units and to build up new groups. In sublimated form they are the source of the richest human culture. In general, they are creative and life giving†. The aggressive instincts are the opposite of the sexual. In pure form they are separating rather than binding, tend to break down rather than build up, are destructive rather than constructive.

*The term *sexual* is used by psychoanalysis in a widely extended connotation. If one prefers for esthetic or other reasons to use the word *love* or even *social* instead of *sexual* it will not be incorrect but is less specific when attempting to deal with origin rather than with effects.

†Formerly the so-called self preservative instincts were considered in a class apart. Through the development of the concept of narcissism (self love and self interest) it has become appropriate to include them as one manifestation of the libido or sexual impulses.

tive, and lead toward death. Normal mental functioning is sustained by the balanced activity of this dichotomy of instincts, and the two groups play an equally important part in a constructive adjustment to the outside world.

Both classes of instincts, when operating in elementary form, bring the individual into sharp conflict with the environment, and also are incompatible with each other. Primitive instinct manifests itself as a state of uncomfortable tension, seeks direct discharge without regard to consequence and is highly asocial. The person directed solely by such impulses would not long survive. The goal of psychological development is to divert and modify instinct until there is achieved a relative unification on levels of social adaptation. The primitive, elementary, instinctual organization of the child, through an orderly evolution becomes the matured and unified instinctual organization of the adult. In other words, mental maturity means a socialization of the instincts, and in this process the sexual and the aggressive act upon and modify each other to fuse in various proportions. Thus, in the healthy person, love in all its forms borrows from aggression and thereby becomes a type of self-assertion which brings fulfilment of all instinctual needs. In the same fashion, when the aggressive instincts take a primary position, they are sufficiently sexualized (made loving or socialized) so as to lead away from the purely destructive toward some constructive and useful manifestation of power. In civilized society, there has been a marked subordination, or at least concealment, of the instinctual forces of aggression (hostility) by those that are sexual (loving) in nature. Thus an understanding of the part played in human psychology by the development and vicissitudes of the aggressive instincts has followed somewhat tardily the more complete knowledge of the evolution of the sexual instincts brought together in the so-called *libido theory* of Freud.

However, the mental life is not so simple as all this might imply. Man, at least adult man, is something more than a bundle of instincts however socialized and domesticated they may be. He is also a moral being with a conscience, or what psychoanalysis calls a super-ego. In its beginnings the instinct life is controlled and disciplined by environmental factors, chiefly by the influence of those persons with whom the child is most in contact, usually the parents. Later on he develops something within himself to act as substitute or representative, and the nucleus of the super-ego is made up of an internalization (introjection) of this early human environment. From then on, instinctual evolution is not only the result of the guidance and pressure of the external social code enforced by the parents, but is also affected by an inner personal code, i.e., the super-ego, which takes

over more and more responsibility for instinct development and control. The mentally healthy adult has not only organized his instincts to a form adapted to the outside world, but has also constructed a super-ego roughly representative of the social demands of his time. Thus the instinctual life, the driving forces of his psyche can find a relatively free outlet without too great collision with the physical or social environment or undue conflict with his own super-ego. Free outlet for instincts at socialized levels means the fullest utilization of psychic energy and reacts to the advantage of both the individual and the group.

In the case of the neurotic the situation is different. Due to causes in large part unknown he has not been able to attain the capacity for free energy discharge, and much is wasted in futile inner struggle. Both development of his instinctual life has been interfered with and super-ego formation has become distorted. Instincts have remained fixed on an elementary, infantile and asocial level. The super-ego is punitive and inhibitory instead of being a guide and ideal. It, also, is infantile and stands for a kind of hypermorality based on exaggerated childish values of fear and guilt rather than on those of adult reality. In relationship to instinct the super-ego acts more as a harsh tyrant than as a sane representative of the social order. In the neurotic, both sides of the psyche claim too much. Undeveloped instincts strive toward elemental and unsuitable expression. The super-ego demands impossible prohibitions and rejections. Insoluble conflict results, and an adjustment is possible only on the basis of a neurotic compromise. This compromise appeases both sides to some degree, but at the expense of sharp limitations to a free mental life. The individual within whose psyche this disturbance has occurred is little aware of what is going on. Under the influence of what is called *repression* by psychoanalysis, both conflict and compromise are deeply unconscious. Repression, by which is meant the automatic elimination of mental material from consciousness, acts as a protective mechanism against a direct facing and acknowledgment of intra-psychic situations which would be unbearable to the conscious ego.

Borrowing once more an analogy from the physical realm, the primary conflict and the resulting compromise in a neurosis are organized so as to become a deep reflex-like structure self-perpetuating, and quite cut off from any influence by direct volition. The individual is no more able to modify this mental pathology by exercise of his will than he is to affect his heart action or nutrition. The neurotic symptoms of which the patient is conscious are surface manifestations of this deep-lying psychopathology. The patient suffers and longs for relief wholly unaware that in a sense he has really chosen

the neurosis in order to serve a double purpose. On the one hand, it is a protective scheme against what seem to be unendurable difficulties, on the other, through the outlet furnished by the symptoms, it gives an indirect and disguised satisfaction to repressed instinctual needs. A neurosis, therefore, is an adaptive mechanism for the psychologically handicapped, a way of life developed to meet the world as well as possible for the person with inadequate equipment of instinct and super-ego.

(B) *Method of Treatment*

Psychoanalytic therapy is a specific method aimed to bring the pathology of neurosis from the unconscious to the conscious mind, as it were, to transfer it from the field of the reflex to that of the volitional. This means lifting the material of conflict near enough to the surface to be influenced by present-day reality represented by the conscious mind. In so doing, adult standards can be brought to bear on issues which previously have been ruled by the distorted values of infantile imagination. Through psychoanalysis there is a second chance for that evolution of instinct and construction of a healthy super-ego (conscience), all of which in a more favorable case would have occurred spontaneously in childhood. In properly chosen cases, blocked, fixated, inhibited instinct has a new opportunity to go on to complete development. At the same time the hypermoral, puritanic conscience can be remodelled more in accord with the standards of social reality.

All this is no light task, and can only result from a slow process more analogous to growth than to amputation or grafting. All the mighty forces of the original repression manifest themselves as *resistance* during the treatment. Resistance is the term given to the automatic unconscious barriers which intervene against attempts to become aware of the forces in conflict. Analytic technique is in large part directed to overcome these resistance barriers, and thereby gain access to what lies beyond. Two unique procedures peculiar to psychoanalysis help circumvent the resistances. First, the patient makes use of free association in his communications, and secondly, the analyst plays a passive rôle.

To carry out free-association is the only obligation the analytic patient is asked to assume. Unless he is willing to accede to this, analysis is out of the question. The rule of free association requires that, so far as possible, he put into speech everything which comes into mind, without selection or reservation. The ordinary standards of conversation, such as adherence to topic, orderly presentation, and the social conventions and amenities are abrogated. The only criterion of what shall be talked about is what happens to come to mind. This procedure, by widely circuitous routes, leads gradually toward

an ever deeper revealing of the unconscious mental life. The oft-heard criticism that so-called free-association is really not free, is quite correct. The term simply expresses the fact that when conscious control of thinking is removed, the associative processes are taken over and motivated by unconscious factors. By working backward from the emotional and ideational material brought out by free association, the unconscious forces which determine them are isolated from overlying psychic structures and thus can be revealed.

To summarize, free association refers to that type of thinking which supplements the patient's attempts to fathom his own mind by conscious introspection. The deep self-understanding essential for analytic therapy must come from within, and cannot be transmitted from without. A parallel may be drawn with laboratory work in physics or chemistry, where useful knowledge requires that the individual do the work for himself rather than have it done for him. The region of the unconscious is inaccessible to direct intellectual approach by the individual himself, but by free-association he is able to take up the task where the former method comes to an end.

The passive rôle of the analyst will come up for more detailed discussion later on. Briefly stated, it means that he avoids both the indulgent and authoritative attitudes, one or the other of which the patient has been accustomed to meet in other types of psychotherapy as well as in all the usual relationships of real life. For reasons which will be outlined more clearly subsequently, the analyst limits his activity to interpretations of the mental content brought out by free-association which, by reason of his training and detached position, is in many respects more intelligible to him than to the patient himself, who is tangled in his own repressions and resistances. However, there is nothing infallible about these interpretations and they are not presented as final. If they are correct and given at the opportune time, they stimulate the production through the free association of new material from the unconscious. If they happen to be incorrect, they fall on stony ground and no such results will follow. Nor does the analyst lose caste with his patient on account of making a false move now and then. The two are working together on an obscure problem with the analyst in the position of ally, rather than that of prophet. A more dogmatic and pedagogic use of the interpretative method made possible by the new psychology of Freud may not be without benefit. However, when so used it is not analysis, but the old suggestion and reeducation under other names and open to similar disadvantages plus some new ones all its own.

By persistent use of these procedures of free-association and passivity, two processes appear in the patient which constitute the dynamics of

the therapy. The first is *remembering*, the second is *reliving*. Remembering means a gradual extension of conscious grasp to the early childhood period, where the basis of the neurosis was laid down. Here the interference and distortion of the instinctual development and super-ego construction occurred and in this form they still remain. This reconstruction of the psychological past life through memory is accomplished partly by breaking through the infantile amnesia, thereby recovering important childhood experiences, partly by revaluation of material retained in memory but isolated from its emotional significance, and still more in other ways such as fantasy, inference and analogy. All this in successful cases means something very different from a mere verbal autobiography. There results a certain inner conviction and realignment of values which lead toward constructive change.

By *reliving* is meant the actual emotional experience of the analysis itself. This is accomplished through what is called by psychoanalysis the *transference* and will receive later consideration in this paper in its bearing on general psychotherapy as a special therapeutic force. Suffice it to say here that in the transference relation to the analyst, the hidden patterns of the patient's emotional organization, fixated at immature levels, are brought into the light. This repetition of patterns of course does not appear exclusively in analysis, but occurs in the ordinary relationships of real life. There is, however, a striking difference. The general set-up of the analysis is such that the repeating of patterns is far more free from disguise than elsewhere. The passive rôle of the analyst reduces the reality features of the physician-patient relation to a minimum and from behind the barriers which act as a screen in ordinary situations appear the unresolved childish attitudes of the patient which function as fantasy projections toward the person of the analyst. He becomes for the patient a phantom-like composite figure representing in turn various important people of the early milieu. These primary human relationships furnish the individual's apprenticeship for the business of mental adjustments in the adult world. Such of them as have remained imperfectly solved are reactivated in the analysis with something of their original vigor. Gradually the neurotic individual is able, as it were, to see himself in action with increasing clarity and conviction, until his deep-living conflicts made up of undeveloped and contradictory needs are spread out before him. By a combination of these two processes, remembering and reliving, the patient, in spite of his resistances, gains continually deeper insight into the defects of his psyche and parallel with this it becomes possible for him, as never before, to bring to bear the influence of his conscious adult mind upon the forces of conflict within him. In an appropriate case

the rigors of a punitive super-ego are mitigated and the instinctual life freed from crippling inhibitions, measured in terms of infantile guilt and terror, can make a tardy development toward a normal adulthood.

The subject of the patient-physician emotional relationship should not be dropped without pointing out a final important step in analysis, which is called the resolution of the transference. By this is meant that, before the treatment is successfully over, the patient must understand the significance of the transference relationship and be able and willing to give up the special dependence on the analyst which it implies.

It should by no means be understood that the physician in an analysis takes the part of a non-participating dummy partner. In a subject whose analysis is well under way, two tendencies are evident. One is toward a self-understanding through uncovering the disturbing unconscious material. This represents some normalizing dynamic force, which may be called the "will to health" and which strives to seek out and vanquish the obstacles that stand in the way. The other tendency opposes this, as though such encroachment on secret places would bring danger or rob the individual of something valuable. This is the "will to illness," by which is found a superficial peace and seeming security at the expense of the neurotic compromise. Unsatisfactory as such a compromise may be, it offers something to the patient which makes it appear the lesser of evils, and he holds to his position with great tenacity. The first tendency leads to participation in the constructive purpose of the analysis. The second motivates the resistance. It is as though the individual were divided in his unconscious mind into two opposing factions, between which in the past there was a complete deadlock. In the analysis, the struggle is renewed with the analyst engaged by one side as an ally, and this makes possible a new chance for victory. When the tendency toward the normal is in the ascendancy, the analysis goes on by itself while the physician simply stands by, with occasional interpretations to help make articulate for the patient mental content which seems close to the surface. When resistances have the upper hand it is the physician's part to point them out and thereby weaken their effect. Resistance is motivated from the unconscious and can only operate successfully in disguise. Whenever recognized by the patient, that particular form of its manifestation loses much of its force and in the process of falling back to another line of defense, some ground is gained for the advance.

An analysis may be compared to a spring log drive in the north woods. For periods the logs move steadily on under their own momentum. Then there is a jam which, once formed, is only made stronger as the oncoming logs pile up behind. Natural forces are of no avail. Some outside agency must intervene or the blockade will

be permanent. Here the watchful riverman plays his part and by well-directed attack on the key logs, the whole mass moves on again. So the analyst, watchful in his passivity, strives to break up the deadlocks of opposing forces which occur and reoccur throughout the analysis. To be in a position to play this part, it is necessary that he know what is happening in those hidden mental regions which furnish the scene of activities. It is his task to penetrate so far as possible the drama of the patient's speech and attitudes and see what is going on behind the scenes. It is this knowledge which the patient must have in order to proceed and which he can never gain by himself. The analyst in his detached position and with his special training is prepared to give aid which is directed solely to this one purpose of helping the patient gain an increased insight into his own psyche. The main work of the analysis is done by the patient. Those forces within him which strive toward health are able to operate as they could not do without the reinforcement of the analysis.

All these psychic processes take place in an obscure realm and are not readily recognized in the disguised form in which they appear in consciousness. Some of the time, the analyst by the application of general theoretical knowledge, is clearly aware of what is going on. Again, he is for a time in a fog as well as the patient. It is then that he must supplement his theoretical and empirical knowledge with a trained intuition, and be satisfied for a time to grope forward in the dark. This intuitive function is called by psychoanalysis *identification*. The analyst when he cannot see clearly in an objective way, tries to follow the processes in the patient's mind by a kind of mirror-like reflection of experience in his own. This identification in psychoanalysis is no different in its nature from that accomplished by poet or artist, or the purely intuitive therapist. It is, however, more readily made conscious, more free from personal bias, and is used for a special purpose. In the analyst, the capacity for identification is to a considerable degree perfected by the introspective knowledge of his own mind gained from his special training, which includes first of all a thorough personal analysis.

Neither the reliving by means of the transference nor the reconstruction of the early life by remembering will alone suffice for analysis. It is the combination which accomplishes the purpose. The patient must move forward, so to speak, first on one front and then on the other, and it is the analyst's task, when an impasse develops in one direction, to shift activities to the other.

Psychoanalysis as a therapy applies specifically to problems of neurosis where the psycho-

pathology is so deeply unconscious that it can not be effectively modified by other means. More simple methods can help the patient to adjust and to carry on, in spite of his disabilities, and various degrees of social recovery are thereby accomplished. But too often the underlying and faulty instinctual organization of the psyche is left untouched and remains, at the least, as a predisposition to further trouble.

The successful application of the psychoanalytic method is sharply limited by various factors. A degree of intelligence above the average is desirable. The patient must be youthful in years, or at least in mind, the rigid mental makeup so often present in a person neurotic or otherwise in the second half of life, is not easily modified. There must also be a degree of fundamental vigor of personality and capacity for self-help, which not all the mentally maladjusted possess. In addition the circumstances of external life must not too completely limit the possibility for achievement of normal human satisfactions. Finally the time and in private work the amount of money involved restrict the availability of psychoanalysis, and at present compel it to take a place among the luxuries in therapy beyond the reach of the majority of people.

The foregoing remarks apply to the procedure of systematic Freudian psychoanalysis,—a painstaking, intensive and time consuming task requiring months and sometimes years. The psychoanalytic method, however, in its connection with therapy, is not an all or none affair, and it has important contributions to offer to psychotherapy in general of far more extensive application.

INFLUENCE OF PSYCHOANALYSIS ON OTHER PSYCHOTHERAPY

(A) *Transference Therapy*

Among the contributions which psychoanalysis has made to the older methods of psychotherapy, there is one of outstanding importance which alone would be epoch-making. It has banished overnight much of the mystery surrounding hypnosis, suggestion, and other obscure therapeutic relationships. It has thus made possible a shift of scientific interest from the surface and descriptive features of these procedures to the underlying and dynamic ones. In so doing, psychotherapy of all kinds is now able to free itself from a certain taint of mysticism and superstition which has brought a degree of ill-repute. Psychotherapy, formerly looked upon suspiciously by medicine, as a possible bastard child, has been legitimized and become respectable.

This change in status has been brought about

by the concept of transference, that obscure relationship between patient and physician, without which no psychotherapeutic method is of much avail, and with which all methods are to some degree effective. When there is absence of a so-called positive transference relationship, the most profound and helpful truths fall upon deaf ears. When it is present, even the most simple platitudes or naïve medical placebos may have far-reaching constructive effect, while the more valuable and legitimate methods are correspondingly reinforced. What is called transference by psychoanalysis is more familiarly known in its positive aspects as rapport. Good rapport has been recognized as desirable in any transaction between people, from selling washing machines to psychotherapy. In medicine, however, it has been given a place in the background, something like pleasant weather for vacations, a desirable setting for more important business. In therapy, the reputable physician has been inclined to minimize the place of rapport and is on the defensive against charges that rapport rather than specific methods accounts for his success. The charge that a therapist depends upon "personality" rather than special method has usually been made and received as a derogatory accusation implying that he is playing dangerously close to chicanery and fraud. Psychoanalysis has changed all this. Rapport has been given a legitimate place, studied as an important phenomenon in itself and its unconscious significance made plain. The term transference includes the extended meaning of rapport as worked out by psychoanalysis. It proves to be a force which can to a considerable degree be understood and controlled. In therapy, it is a curative agent, so far as possible, to be measured, standardized, and utilized like any other.

The need for transference, that is, to establish emotional bonds of dependence upon other people, is universal in human beings. It is at its greatest during the relative helplessness of childhood. In the normal adult there is substituted a considerable degree of self-sufficiency, a dependence upon the self rather than upon others. The neurotic is in many ways the child rather than the adult in this respect. The exigencies of the external world have forced upon him an appearance of self-reliance which may deceive both himself and others. The maturity of his physique and of his intellect aid in this deception, but underneath the surface there remains much of the emotional helplessness of the little child. He is at the mercy of his undeveloped strivings and antipathies which bring him continually into conflict both within himself and with the external world. When the social veneer presented toward the world can be set aside, as in the relationship with a physician, these under-

lying and for the most part unconscious needs and strivings, rush to the front with renewed intensity. No other relationship, with the single exception of those of a religious nature, make possible such a let-down of the official personality as does that of the medical. The setting aside of the surface adjustments forms the basis of the transference situation between physician and patient. The childish part of the neurotic personality reaches out to the physician, and a relationship is set up akin to that between bewildered, helpless child and strong, resourceful parent.

This, then, is the condition of rapport or transference. It sounds so simple. Previously shrouded in mystery and now revealed, it seems on first acquaintance so banal and unimportant. The mountain gone into labor has delivered only a mouse. But it is well to go cautiously. Important truths are often simple ones and it should not be too difficult to show that the seeming simplicity in this explanation of transference is not the mark of triviality. Before psychoanalysis, only the positive side of the child-parent relationship was made use of in therapy. The underlying emotional helplessness of the neurotic patient, the childish needs for guidance and authority, were utilized intuitively by the physician and he was thus given an almost magical power to relieve distress and to smooth out difficulties. The opposite of all this the childish resentment and protest against authority, are equally active in the neurotic. Formerly they were so far as possible avoided as obstacles to therapy and often looked upon as stubbornness or ingratitude on the part of the patient. If these hostile attitudes, the so-called negative transference, took the foreground, the therapeutic relationship came to an abrupt end and treatment was a failure. The patient either gave up in discouragement, or sought other physicians till one was found with whom the positive transference could be successfully established. With the new knowledge gained through psychoanalysis, both positive and negative transference, as they appear, can be understood in their full significance and utilized for constructive purposes.

Hypnotism offers the best illustration of the transference situation, but is only the most dramatic manifestation of what is present in other methods. To produce hypnosis, the patient is encouraged to be completely passive mentally and physically, to give up all activity and self-assertion. The physician then assumes the rôle of stern authority (father), or persuasive tenderness (mother), and completes the transference relationship. The patient, attaining a kind of complete psychic surrender, gives up all self-direction, and goes into a hypnotic sleep. The situation is then akin to that of the little child

who gives himself over completely to the love of the strong, protective person *

The question whether the normal individual can be hypnotized, or establish any of these relationships, need not too much concern us. The difference between the normal and the neurotic is only one of degree. The normal need for transference often enough comes to the front, particularly in time of trouble. These same needs are manifested in the universal religious strivings of mankind. Even the rough and fearless soldier can be as a little child in his surrender to a divine being.

So once again let the point be made that it is the belittled and often despised transference relation itself which gives the power for healing, sometimes with the aid of the special method glorified by the physician and sometimes in spite of it. It is for these reasons, that is, the power of transference and the disparagement of it as a curative agency by science, that quackery has always been so formidable a rival to legitimate medicine in psychotherapy. The aim of the therapy of the future must be to recognize and accept transference at its full value, and to utilize its force in combination with whatever special methodology is suited to the circumstances of the situation and warranted by the tastes and training of the physician.

(B) *The Use of Passivity*

Another Freudian concept, which is not confined in its application to technical psychoanalysis, is the emphasis on the passive rôle of the physician as a therapeutic dynamic. Passivity has received comment already in this paper, but the topic warrants further elucidation. It is a matter of general knowledge in non-medical affairs, that a person in trouble can often clarify his own thought and feelings and find new strength by confiding his difficulties to a sympathetic and interested friend. Often enough the confidant can think of little to say in reply, and feels woefully inadequate to advise or to guide. He is therefore agreeably surprised when told that his services have been helpful. Apparently something important happens in this kind of interview. The presence of an interested, non-critical listener makes possible a verbalization and clarification of mental content which could not be otherwise achieved. It appears that the person seeking help, objectifies in words his hitherto diffuse and confused ideas and emotional states, and then takes them back into himself with more insight and order than before.

In the past, attempts to deal with the neuroses by methods analogous to these talks with a silent friend have appeared too banal for serious consideration by medicine. The physician is primarily a man of action. He has the urge to therapy in a positive sense, and wishes to do something. To let a patient use him as a kind of foil while he empties and rearranges his own mind seems something of an affront to the dignity of the doctor. He may be quite willing to act solely as a friend, but if he is going to play his part as physician, he prefers to tell the patient what is the matter with him and what he should do. His tendency is to react to the passive rôle somewhat as he might if the patient took the scalpel from his hands to perform upon himself a minor surgical operation. The new understanding of the passive rôle of the physician in the therapeutic interview should make it as compatible with his self-respect as is the case after the injection of a serum, when he waits passively for it to do its work.

An early patient of Breuer and Freud, whose study marked the first step in the development of the psychoanalytic method, referred good naturedly to her treatment as the "talking cure". By the same token, from the standpoint of the therapist, this could be designated the "listening cure", and the listening method, sometimes called the interview method, can now be added to the list of special psychotherapies. This should not be looked upon as too easy a procedure for the physician. Skillful listening in psychotherapy means something more than the loan of an attentive ear. The patient will need help in his unburdening and self-revelations. Without some aid he may not talk at all, or else go around in a circle of fruitless superficialities, like the rocking-chair lady at the summer hotel who talks of her operations.

The material to be brought out in the technical listening interview may be grouped under three heads. First, what the patient wishes to say and has clearly in mind, secondly, mental states which trouble him and that he desires to talk about, but is unable to put into words, thirdly, important mental content, whether or not it is articulate, which the individual consciously or unconsciously does not wish to face squarely and tries to evade. Here some knowledge of analytic psychology is essential, but it does not have to be profound. No deep excursions into the unconscious mind need be made by this method. It is only that part of thought and emotion which lies just outside the patient's conscious grasp which needs revelation. This region is what psychoanalysis calls the *preconscious*, and is concerned more with the actual conflicts of the present than with the infantile substrata which are more deeply repressed. It is the extension of the patient's grasp to this preconscious realm under the influence of the

*For further discussion of transference factors in hypnotism see

- (1) Freud, Group Psychology and Analysis of the Ego. International Psychoanalytic Press, 1922.
- (2) Ferenczi, Contributions to Psychoanalysis, Chap. 2. Authorized Translation by Ernest Jones. Gorham Press, Boston.
- (3) Schilder, Hypnosis, Chapter 6. Monograph Series No. 46. Nervous and Mental Disease Publishing Company.

transference which brings about the benefit in the interview listening method. He becomes better acquainted with his own half-concealed thoughts and emotions, while sensitive topics which it would be difficult to bring out of hiding in any other way, come to the front and are thereby relieved of that morbid strength which was a product of their isolation. Thus is accomplished a replacement of false and immature values by those of that adult reality which is represented by the rationale of consciousness.

The passive listening rôle has an advantage for the physician in that it makes it unnecessary for him to try and formulate in clear intellectual terms all that is going on, either to himself or to the patient. Again as in many examples of physical medicine, the proceeding is justified by the results, and many of the intervening steps can be left in obscurity. If medicine is going to take the lead in psychotherapy it behooves the profession to give earnest attention to modern viewpoints and special technique. Various non-medical agencies are treading on its heels. Already the interview method for dealing with human problems allied to neuroses has been worked out to a considerable extent in social service and in the personnel departments of industry. There is nothing to cause dissatisfaction in this fact, but certainly general medicine should not by indifference eliminate itself from fields which must always be close to its special province.

To keep under way a one-sided conversation in the listening cure requires skill and adroitness on the part of the physician. The patient will often exercise great ingenuity to draw him into discussion, and thereby put the burden of the interview upon him. Again, the patient may seem unable to initiate anything when left alone, and will talk hardly at all except in the give and take of discussion. It is sometimes amusing or aggravating, as the case may be, when a person who is dumb or hesitant if given an opportunity to talk by himself, suddenly becomes eloquent when the physician starts to speak and interrupts so persistently as to make it difficult for the latter to advance any connected point of view. This always means resistance and an attempt to hold the interview on superficial levels. Talking to a listening physician, in contrast to an ordinary conversation with him, tends toward a kind of free-association, which leads to the revelation of deeper and more important mental material against which the patient automatically defends himself.

To sum up the matter of passivity, it is a psychoanalytic concept which requires renunciation by the physician of that kind of parental rôle which is characterized by the exercise of

either indulgence or deprivation. In place of this authoritative relationship, it includes a listening attitude plus an attempted identification with the patient. Thus passivity acts as a special therapeutic force and a simple and practical application of it can be made in the interview method. So used, it operates toward bringing to the surface the material of the conflicts which are the source of difficulty, and works toward a reorganization at more adaptive levels. It applies most successfully to treatment of those problems which the patient himself senses, even if blindly, and when there is present a strong urge to work them out. Incidentally the use of passivity shifts some of the more onerous burden of psychotherapy from physician to patient. As long as this is more fruitful for real aid it is fair for him to rejoice at such emancipation. Often the physician of the past approached the neurotic patient as though going into battle and marshalled all his resources for the struggle. By explanation and inspiration, by exhortation and sympathy, by scolding and cajolery, he endeavored to lift him to a better plane of function. Today in many cases he can stand to one side and help the individual do these things for himself with far more constructive results. In other words, the physician no longer carries the sufferer on his back, but walks by his side along the road toward insight and recovery.

(C) Combined Methods

There are further aids that psychoanalysis can contribute to general psychotherapy in addition to the new and revised uses of transference and passivity as therapeutic agents. In certain practical ways, eclectic psychotherapy can enrich itself by borrowing from actual psychoanalytic technique. Various useful combinations of psychoanalysis and the older methods can be employed to meet particular needs. It is my purpose to outline one special combination which has been used successfully. This is given only as a specific example among others no doubt equally good. In this method the patient is allotted one half-hour a week which, if possible, begins and ends promptly on time. A proper financial compensation for this amount of time is not impractical for a patient of quite moderate means. Neither is such an arrangement too time-consuming for some of the work in a well-staffed neuropsychiatric or general clinic. At the least those interested in psychotherapy in such clinics can take a few patients under this plan. For either private work or clinic, the semi-analytic program proceeds as follows. The patient lies on a couch and the physician sits in a chair behind him and out of sight. The object of this arrangement, as in formal analysis, is to throw the patient more on his own resources. A very brief explanation at the first meeting will banish any strangeness or sense of alarm.

at this unusual procedure. The half-hour is divided into two parts, roughly half and half, but modified as desired. The first period belongs to the patient. He does the talking and the physician says nothing beyond putting the other at his ease and drawing him out by brief comment. There is no coercion or obligation. If dealing with what seem to be important topics, the patient is left to himself, but when he comes to the end of special topics, he is led to free-association and asked to bring up whatever comes to mind on any subject whatsoever. If, on the other hand, he can say nothing, he is not reproved or made to feel at fault. It is understood that the first part of the half-hour is turned over to him, and he can use it as he chooses. If he is inclined to be wholly quiet, and wishes to rest or even sleep, that is all right. He need not be uncomfortable, and the physician can rest assured that this silence will not last for many interviews. All that is recommended to the patient is that whatever comes to his mind about anything at all he will put into words so far as possible.

Sooner or later in suitable cases for this method, the analytic situation develops. That is, the patient tends to let down the social barriers of ordinary conversation, establish friendly or hostile transference, and bring up into words mental material more closely connected with his underlying conflict and difficulties. However, it will not do to let this analytic situation persist as in actual formal analysis. If nothing is done to prevent, the patient will be left too much in midair and too defenceless to continue by himself for the interval of a week. Emotional forces may easily be released which will not be simple for him to manage. Therefore, during the second fifteen minute period, the situation is reversed, and the patient is required to be silent while the physician talks. If there has been free association in the first period, during which time the physician listens passively, some hints and leads for talking points have come up of which he can make use. He can give such superficial interpretations as he sees fit, and continue with suggestion, encouragement or whatever he thinks is indicated. The patient has given the physician and himself a glimpse into the unconscious. This insight is clarified and used profitably so far as possible in a general way. In addition, the aid of other types of psychotherapy is brought to bear to supplement the analytic work and the patient is sent out for the week ahead with renewed strength and support. The analytical part of the hour, so to speak, leaves him somewhat naked to the world while the supportive part reclothes him for the struggle of daily life. In this combined method, the repressions which were let down in the first period are put up again in the second, but in the interim, there is an opportunity for useful modification of the re-

pressed material which has been ventilated in free discussion. Usually at the beginning the patient comes to the time of dismissal full of desire to talk on his own part concerning matters brought up by the physician. He soon learns that he has had his turn, and is satisfied to wait until the next week for what he wishes to say. By that time unimportant and repetitive matters which simply encumber the interview are likely to have disappeared and only the more important issues will be brought up.

At the risk of undue repetition, further warning should be given at this point concerning dangers connected with these combined methods of therapy. In making use of them it is far safer to attend strictly to current conflicts and difficulties and avoid any attempt to deal with problems of the deep unconscious. These current conflicts are concerned mainly with the more superficial significance of the presenting neurotic symptoms and with the disturbed relationships which always exist with people of the immediate milieu. In particular, caution needs to be observed by physicians without technical training in psychoanalysis. Repressed unconscious material which is powerful enough to cause a long-continued neurosis has dynamite in it. If set off systematically and by degrees in a formal analysis, that is one thing, to explode it all at once by overenthusiastic or careless handling is another, and one which may bring about intensification of symptoms and general emotional turmoil. These undesirable and sometimes alarming reactions may result from either of two errors in technique. First, they may follow too frank and hasty interpretations of underlying psychic mechanisms which the physician can see clearly, but which the patient is quite unable to assimilate without long preliminaries. Often the nearer correct such interpretations happen to be the more undesirable are the effects. The second and still more dangerous error is to allow the transference situation to get out of control. So long as the physician maintains the authoritative or kind father rôle, as is the case in the older psychotherapies, there is not likely to be trouble. In such situations the neurotic patient reacts in the transference much as in his relationships to people in everyday life, with his underlying infantile attitudes so sifted through layers of repression that they can be acceptable to his conscious mind. As already explained, when the physician takes the passive analytic rôle there is a tendency for repressions to be set aside while there come to the front the unconscious needs and stirrings which are accompanied by fear as well as desire.

In the combined method under discussion this must only be permitted a little at a time and the dosage can be governed rather automatically by the procedure, already described, of shifting from the analytic situation to that of ordinary psychotherapy in the latter part of

the treatment hour or at other times as indicated. This shift of situation is accomplished when the physician drops his passive detached and listening position becomes active and authoritative, and does the talking himself. By this change, the transference situation is held within bounds, whether in the new role the therapist chooses to reassure, give suggestions, advise in a practical way, or lay down the law.

At another time it is hoped to describe more fully and with illustrative clinical material this combined utilization of analytic and preanalytic methods. Incidentally, in the hands of a trained analyst, the same plan has been found of diagnostic value where the advisability of a systematic analysis is under question. If carried over a period of a few months, this program, whatever other profit may result, will show convincingly whether or not a more complete analysis should be advised.

SUMMARY

In final summary, the attempt has been made

in this paper to bring psychoanalysis from its isolated position as a highly technical specialty into more close connection with that everyday psychotherapy which for the majority of neurotic problems must continue to be the main resource in medicine. It is hoped that this discussion will encourage some of those who wish to use psychotherapy, to develop their own methods with additional understanding and fresh interest, and that they will look upon the obscure forces which they are manipulating as worthy of the same scientific consideration as other therapeutic agencies.

It is also desirable that the conscientious physician outside the specialty of psychiatry should not feel that because he is untrained in mental major surgery he should leave the whole field of psychotherapy to other hands. In this department of medicine, there is need for minor surgery as well as major, and the former can be competently done by all physicians general or special, who in an earnest spirit, are willing to undertake it.

A REPORT OF AN INVESTIGATION RELATING TO LIMITING THE SIZE OF FAMILIES

Efforts of couples to limit the size of their families by ordinary preventive methods without special medical instructions in their use are about 75 per cent effective during the time these methods are used according to the report of an investigation by Regine K. Stix M.D. and Frank W. Notestein of the Milbank Memorial Fund in the current issue of the *Foundations Quarterly*.

An important finding of the investigation was that the preventive methods various in kind did not in any way lower the capacity for motherhood when this was desired. The number of births averaged 2.26 for an average of less than ten years of married life.

The records for this study were obtained from 714 women living in the Borough of the Bronx, New York selected because they had come to a birth control clinic for advice. Each woman was interviewed by Dr. Stix on her experience with 'untutored efforts' at family limitation before her first contact with the clinic. The analysis covers only the pre-clinical period in each case, which ended in 1931. Careful statistical allowances were made for all factors of time and marital life, and the results indicated an effectiveness of 75 per cent of control for the time when tried.

About 97 per cent of these women had made some effort to limit their families before attending the clinic. Of these more than half did not try to limit their families until after they had had at least one child.

The families studied had a median income of \$2,300 in 1929 and of \$1,200 in 1932. About one-fifth

of the families were destitute or supported by organized relief in 1932.

This investigation sponsored by the Milbank Memorial Fund is one of a series of studies on population problems, which have for their purpose the assembling of scientific knowledge regarding the effect on the birth rate of such factors as race-stock, education, income and the spacing of children. Among these studies is one directed by Dr. Raymond Pearl, of the Johns Hopkins University, on the prevalence and effectiveness of preventive methods in family limitation. Dr. Pearl obtained his data in cooperation with physicians in 131 hospitals located east of the Mississippi River.

A BEQUEST TO THE CHILDREN'S HOSPITAL IN BOSTON

The will of Irving Richardson of Brookline contains a grant of ten thousand dollars to the Children's Hospital. Such evidence of appreciation of hospitals is gratifying to such institutions and the medical profession. This particular recognition of the Children's Hospital will enhance the important work carried on in this very useful institution.

A STUDY OF ENCEPHALITIS

Senior Surgeon J. P. Leake has been directed by the United States Public Health Service to visit New York, Boston, Mass., Springfield, Mass., Philadelphia, Pa. and other places in these states as may be indicated for the study of encephalitis.

CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F M PAINTER, A.B., ASSISTANT EDITOR

CASE 20041

PRESENTATION OF CASE

First admission A sixty-six year old American expressman entered three years before his final admission with the complaint of epigastric discomfort and dizziness of three months' duration

For the past year and a half he had been troubled with headaches. Six months before entry these became more frequent and for the past three months had increased in severity. They were suboccipital and radiated to the frontal region a short time after the onset. They were not brought on by exertion and bore no relation to any other factors. They were described as severe, with continual throbbing in the back of his head and ears. For the past six months he had been emotionally unstable and very often had had fits of crying. Three months before admission, at the same time that his headaches increased in severity, he began to experience fairly continuous dull aches in his epigastrium and along the left costal margin. These attacks had been present for the past three months and were worse immediately after eating. They were relieved by pressure, not by soda. The pain radiated into his chest beneath the sternum and at times was accompanied by a feeling of bloating and distention. He had however no belching and no sour eructations. There was no dyspnea on exertion and no edema. He had had blurring of vision frequently during the past three months and on two occasions completely lost the sight of his right eye for about one minute at a time. He stayed five weeks at a sanatorium but received no drug therapy there.

Family history His father died suddenly in bed at the age of sixty-one. His mother dropped dead at the age of sixty. One sister was living and well at seventy-five. One brother died at the age of eighty, having had two shocks previously. One brother died at thirty-five of Bright's disease.

Examination showed a well developed and well nourished man in no distress. The sclerae were injected and questionably icteric. The lungs were clear. The heart was slightly enlarged. The left border of dullness was 10.5 centimeters from the midclavicular line. There was a rough systolic murmur heard loudest at the apex and the aortic area. There was also

an aortic diastolic murmur. The blood pressure was 230/110. At the apex the first sound was obscure, the second sound increased. The peripheral vessels were hard and beaded. There was no capillary pulse. Examination of the abdomen was negative except for bilateral inguinal herniae.

Examination of the urine showed a specific gravity of 1.018 to 1.030. There was a slight trace of albumin on two of four examinations. There were about forty white blood cells and numerous hyaline and granular casts on two examinations. The examination of the blood showed a red cell count of 5,400,000, hemoglobin 85 per cent, and a white cell count of 9,000, 63 per cent polymorphonuclears. The Hinton test was negative. The non-protein nitrogen was 36 milligrams. The phenolsulphonephthalein test showed 35 per cent excretion in thirty minutes.

An electrocardiogram showed normal rhythm, rate 80, QRS complexes slurred and widened. There was diphasic T₁ and T₂.

X-ray examination of the heart showed it to be considerably enlarged. The total transverse diameter measured 16.5 centimeters, the chest diameter 28.5 centimeters. There was no increase in the supracardiac shadow.

One examiner believed that he felt a plateau type of pulse. He felt no thrill but heard a loud blowing high pitched systolic murmur at the base which was transmitted to the neck on both sides. The patient was discharged improved on the nineteenth day.

History of interval After his discharge he always felt tired, especially in the morning upon awakening. He was also very much upset because he was losing his sexual power, especially during the two years just preceding his reentry. Five months before admission he lost his memory for a few days. He believed this was due to the digitals which he was taking and consequently discontinued it. Three months before admission he began to have dyspnea, which gradually increased in severity, making him almost breathless on the slightest exertion. For three weeks before reentry he had a constant and severe headache. One week before admission he became emotionally upset, began to cry, and feared that he was going to die. He had no edema and no orthopnea.

Second admission, three years after the first. Physical examination showed a fairly well developed and poorly nourished elderly man in great mental and respiratory distress. There was marked pallor and cyanosis. His breath was uremic. He was sweating profusely and his skin was cold and clammy. He was completely edentulous. The retinal vessels showed marked sclerosis. There was dullness with diminished breath sounds at the right base, with fine moist râles. The expansion of the chest was poor. The heart was enlarged. The sounds were of poor quality, absolutely irregular and feeble. There was an apical gallop rhythm.

There were systolic murmurs at both apex and base. The aortic second sound was equal to the pulmonic second. The blood pressure was not obtainable. The liver edge was not felt. The dullness was down one fingerbreadth.

The urine showed a specific gravity of 1.020 with a very slight trace of albumin. There were two to four white blood cells per high power field and large numbers of hyaline and a few granular casts. Examination of the blood showed a red cell count of 5,300,000, a hemoglobin of 55 per cent (*sic*). The white cell count was 16,600, with 70 per cent polymorphonuclears. The stools were negative. The non-protein nitrogen was 115 milligrams. The Hinton test was negative.

The patient failed rapidly and died one week after admission.

DR. GEORGE W. HOLMES. The film which we have was taken at the time of his first admission and shows considerable enlargement of the heart, particularly towards the left in the region of the ventricle, also a moderate degree of tortuosity of the aorta without evidence of dilatation.

There is nothing unusual in the lungs and no change in the outline or position of the diaphragm.

DIFFERENTIAL DIAGNOSIS

DR. HOWARD B. SPRAGUE. There are a few differences between the story that has been given here and the summary that I had. I will try to see if there is not some consistency to the story however.

A man of sixty-six comes in complaining of definite evidence of cerebral arteriosclerosis evidenced by his headache, by his fits of crying, his depression and his emotional instability. In addition, he has epigastric discomfort which Dr. Chapman says was relieved by food but which my summary says was worse immediately after eating. I think we shall have to say that this fits in with the so called gastric masquerades of coronary disease.

The story does not seem consistent enough to make one think of malignancy or ulcer or gall bladder disease. He at that time had no dyspnea on exertion, and the story then was of an anginal character and one suggesting cerebral arteriosclerosis.

There is a striking vascular family history. The mother and father died suddenly at about the age that this patient had reached.

As far as the physical examination is concerned, especially the heart, we find cardiac enlargement, a blood pressure of 230/110 and an aortic systolic murmur. There is a note here that an aortic diastolic murmur was also heard. There is a suggestion that he may have had a plateau pulse. This evidence should be weighed, at least as far as its indicating valvular disease is concerned. At his age one thinks of sclerotic aortic stenosis. We have well marked hypertension. The systolic level is high, the diastolic

moderately high. The aortic second sound is present and there is no thrill mentioned over the aortic area, I should think the evidence was in favor of this being an aortic systolic murmur due to dynamic aorta and hypertension and not to aortic stenosis.

There was no great evidence at first of trouble with the renal picture.

He had an electrocardiogram which would be characteristic of arteriosclerotic coronary disease but not of coronary occlusion at that time.

Three years later he comes in having had the same cerebral difficulties but with additional progress of cardiac failure. We can say that the cerebral symptoms before were not due to congestive failure, so he must have had a bad condition of the cerebral arteries and not a functional disturbance, because we are only now getting congestive failure. We also have evidence of difficulty with the kidney function, with a non-protein nitrogen of 115.

The sounds in the heart at this time were feeble. Apparently auricular fibrillation was present, but there is a note here that he had gallop rhythm. Gallop rhythm with auricular fibrillation is not a common description, that is, gallop rhythm signifies a sound like the galloping of a horse. With auricular fibrillation and absolute arrhythmia it is difficult to get that impression in your mind. It would be like a three-legged horse galloping.

He has had some sort of attack recently, with marked weakness and a sense of impending death. The blood pressure is said to be unobtainable. One wonders if this could have been a relatively silent coronary occlusion.

I should say then that the diagnosis was general arteriosclerosis cerebral, cardiac and renal, with hypertension and with angina followed by congestive failure, uremia, possibly terminal bronchopneumonia, with a question as to whether there may have been some actual cardiac infarct.

DR. RICHARD C. CABOT. I am interested in the words dynamic aorta. I have always heard that used as an aorta that jumps, bounds and expands extraordinarily in the epigastrium. Dr. Sprague is evidently using it in another sense. I should like to know what it is.

DR. SPRAGUE. I mean in hypertension we get during systole dilatation of the aorta that allows a relative expansion far out of proportion to the size of the aortic ring, resulting in a systolic murmur not signifying valvular disease.

DR. TRACY B. MALLORY. Have you anything to add, Dr. Palmer?

DR. ROBERT S. PALMER. I followed this patient in the Outpatient Department after his first admission to the wards. I thought at that time it was perfectly obvious that he was suffering from the late effects of long standing hypertension. During that time he appeared to be dying at the top, as it were, with episodes of disorientation, loss of memory and confu-

sion I felt that the differential diagnosis was between the so called hypertensive crises and minute thrombi with small areas of softening

I think he was especially extraordinary in the amount of obvious peripheral sclerosis which he had, both in the eyegrounds and the other peripheral vessels, so that in the Outpatient Department in the last year it was very hard to obtain the blood pressure by auscultation and hard to palpate his pulse. However, the blood pressure could be estimated by the oscillations of the mercury column and the blood pressure remained up

From the physical examination I think he probably shows sclerosis of the aortic or very possibly of the mitral leaflets at autopsy. Depending on what your definition is, you could call it aortic stenosis or not

I did not see him at the end and I wondered whether he had enough sclerosis in the kidneys to give actual kidney failure or whether the renal failure was due to general passive congestion

I shall be especially interested if the head was examined to know if he had multiple areas of softening

CLINICAL DIAGNOSES

Generalized and cerebral arteriosclerosis
Arteriosclerotic and hypertensive heart disease
Congestive failure
Auricular fibrillation
Secondary anemia
Aortic stenosis?
Bilateral inguinal hernia.

ANATOMIC DIAGNOSES

Coronary thrombosis
Cardiac infarction
Mural thrombi, both ventricles and right auricle
Pulmonary embolism with infarct, left lower lobe
Cardiac hypertrophy, hypertensive type
Aortic stenosis, calcareous
Arteriosclerosis with calcification, marked coronary and aortic
Cholelithiasis
Hydrothorax, bilateral

PATHOLOGIC DISCUSSION

DR MALLORY Again, unfortunately, we did not have permission to examine the head

The main findings were a greatly enlarged heart with infarction, which was situated at the apex of the left ventricle, involving the lower portion of the interventricular septum and also the apex of the right ventricle

A quite unusual finding, although probably not of great significance in the symptomatology of the case, was another entirely separate infarct in the right auricular appendage with a small thrombus overlying it

The occlusion of his coronary was in this case fairly typical. It was in the descending branch of the left coronary, though nearly 5 centimeters from the origin of the vessel rather than close to the point of bifurcation where we usually find it. In this case there was a frank thrombosis

The aortic valve showed a quite definite degree of calcification on the surface of the valve cusps towards the sinus of Valsalva, the usual spot in which atheromatous deposits occur. This resulted in a pyramidal wedge shaped mass of calcium sticking up from the base of each aortic cusp and making I think a significant though not great degree of aortic stenosis of the typical Monckeberg's type that seems to be very definitely due to arteriosclerosis, not to a previous infectious process

I think the renal picture is of some interest in this case. Three years before his death he had a normal kidney so far as functional tests were concerned, and yet he died in the hospital in uremia with a secondary anemia, peculiar in character, a hemoglobin of 55 per cent and a normal red cell count. It suggests to me a rather rapidly progressing renal lesion. Some people, Aschoff in particular, have talked of what was called a compensated and a decompensated stage of renal arteriosclerosis, pointing out that cases may run along with a slowly progressive lesion for a long period of time and then suddenly the process appears to flare up and the progress becomes very rapid. The clinical and histologic findings in this case would fit very well with such an idea. I think if the X-ray Department had been asked to look particularly for aortic stenosis in this case they undoubtedly would have found it. There was extensive calcification, which should have been readily visible, and I rather doubt that there is any other way in which we can pick these cases up. Would you agree with that, Dr White?

DR. PAUL D WHITE Yes, the mildest, slightest degrees cannot be diagnosed clinically. A moderate degree might have been suspected, as Dr Sprague suggested, and the x-ray evidence if it could be obtained would be very important.

DR GREENE FITZHUUGH Did he not have too wide a pulse pressure to have had a plateau type of pulse? The blood pressure was 230/110

DR SPRAGUE Yes, I think he did. The description of plateau pulse is pretty subjective. If a person believes aortic stenosis is present he is apt to describe a plateau pulse in order to complete the picture

DR. WHITE It is also important to know that we can have aortic stenosis with a very full pulse. The other day we examined a young man with aortic regurgitation, a marked aortic systolic thrill and a murmur that could be heard off the chest, and the pulse pressure was over one hundred

CASE 20042

PRESENTATION OF CASE

A forty-six year old Maine housewife entered with the complaint of abdominal distention of a month's duration

One month before admission about two hours after her evening meal the patient noticed that her abdomen was slightly distended. The distention increased during the evening and was associated with severe pain, chiefly in her flanks but spreading upward to the interscapular region. The pain was worse at the end of expiration, making it difficult for her to breathe. She had no nausea or vomiting. She had no bowel movement that day and was unable to pass any gas. After about an hour the pain gradually decreased in severity, although the distention persisted. She awoke the next morning feeling well except for general abdominal tenderness and slight distention. During the next week she had two similar attacks. Her abdomen remained definitely distended between these attacks. Ten days before admission after an attack she was seen by a physician who gave her a laxative. X-ray films were taken after a barium meal. One week before admission her appetite became poor and she took a shredded wheat biscuit for supper. Half an hour later she became nauseated and vomited. Since that time she had had a steady feeling of something tugging downward in her abdominal organs. Two days before admission she suddenly felt nauseated and began to vomit. The vomiting continued all night and also the following day and night. The distention was more marked. At the same time she developed a sharp substernal burning sensation which remained until the morning of admission. The vomitus did not contain any blood. During the past two weeks she had eaten very little and her bowels had moved every day with their usual regularity. There was always a little bright red blood in the stools, but she said that she had had this for at least three years and that it had not increased in amount. There were no tarry or clay colored stools. During the past ten days her stools had become definitely decreased in diameter.

Family history Her mother was living and well. Her father died at the age of sixty-one of apoplexy. One sister was living and well.

Marital history The patient had been married twice. She was divorced from her first husband after fifteen years. She had two children by her first marriage. Both these children were living and well. There had been two miscarriages. She was married a second time five years before admission. Her husband was gradually becoming blind.

Past history irrelevant.

Physical examination showed a poorly developed and nourished woman in no apparent distress. There was evidence of a considerable loss in weight. The skin and mucous mem-

branes were pale. The abdomen was moderately distended. There was a slightly tender hard mass approximately 4 by 7 centimeters in the midline just below the umbilicus. The mass was not freely movable. The uterus was retroverted. There was a small fibroid on the posterior aspect. The heart and lungs were negative. The blood pressure was 132/88.

The temperature was 99°, the pulse 88. The respirations were 20.

Examination of the urine showed a specific gravity of 1.026 and a slight trace of albumin. Examination of the blood showed a red cell count of 5,200,000 with a hemoglobin of 80 per cent. The white cell count was 11,000. 69 per cent polymorphonuclears. The stools were normal. A gastric analysis showed 750 cubic centimeters of fasting contents. Guaiac was negative. There was 12 cubic centimeters of free hydrochloric acid, after histamin free acid 44 cubic centimeters. The non-protein nitrogen was 42 milligrams.

X-ray films taken at an outside hospital showed a constant defect on the greater curvature side in the prepyloric area.

On the sixth day an exploratory laparotomy was performed.

DIFFERENTIAL DIAGNOSIS

DR BETH VINCENT I must confess that the history, which I had the privilege of reading before you heard it while it suggests of course an abdominal condition does not make clear to my mind the type of abdominal disease with which we are dealing. Here is a woman forty-six years old who for a month is troubled mostly by distention and pain and at times in these attacks by a good deal of nausea and vomiting. Whether the distention and the symptoms are due to an inflammatory lesion in the abdomen or whether they are to be accounted for by subacute obstruction I think we cannot tell from that history alone. Moreover, the history does not seem to me to place the site of the lesion with any definiteness. I do not know whether I should expect to find an upper or a lower abdominal lesion.

When we come to the physical examination we at once get a very definite lead. This patient was a thin woman, I take it, with a rather prominent abdomen, and in spite of that they could feel a tumor in the midline just above the umbilicus that in one dimension was about as long as my finger and in the other dimension about half as long. The abdomen was prominent. That was due to distention, so I suppose we can assume that there was no very great amount of free fluid in the abdomen.

When the surgeon feels a mass like that I think he first tries to make up his mind whether he is dealing with an inflammatory lesion or some form of tumor. From the point of view of its being possibly an inflammatory lesion we look back to the history, and while we have no record of a temperature during these attacks,

when she was in the hospital I think she had a temperature of 99° and a leukocytosis of 11,000. If it is inflammatory it is not in a very acute stage. If it is inflammatory I will say also from the surgical point of view, that the location of the tumor is rather unusual. In a woman of that age if you felt that same mass in the right upper quadrant you would think of gall bladder, if in the right lower quadrant you would say in all probability that you were dealing with subsiding appendicitis.

If it is inflammatory, what can it be? She could have tuberculosis and this might be a manifestation of this disease localized in the glands of the mesentery or in the great omentum. It is just in the region of the transverse colon, and a woman of that age might be suffering from diverticulitis with a secondary abscess. In my experience however diverticulitis occurs more often in the left lower quadrant and is associated with the sigmoid flexure. If the sigmoid flexure is of a movable type the tumor may be over in the right quadrant and the sigmoid being coiled down there, the disease may simulate appendicitis. As far as that goes, and in the absence of a bismuth enema x-ray to help in showing diverticulosis, I think we have no clear evidence that this can be diverticulitis. Neither of these conditions is very common.

As to tumor—and by tumor of course I mean neoplasm or some cyst—this mass, as described, seemed slightly tender and hard and not freely movable. First we have to consider the structures situated in this region, and there are a good many just there that might be involved. We have spoken of the great omentum. Of course there may be a loop of small bowel here, but it is only fair to say that tumors that involve the loop of the small bowel are very rare and are apt to be more mobile than this is described as being, unless fixed to the anterior wall. The same might be said of tumor of the transverse colon, although I should not expect that to be so mobile as a tumor of the small bowel. It may also be fixed to the abdominal wall. In addition, before we go on to the other structures, a woman of forty-six might have a metastatic manifestation of ovarian tumor there. One would not go further before making a pelvic examination. In this case it showed a retroverted uterus with a small fibroid on the posterior wall, so I think it is fair to assume that there was no malignant pelvic disease that had spread to the upper abdomen. As to the other structures in that region, we have spoken of the transverse colon, and of course there is the stomach. It does not have to be a very low stomach to make a tumor palpable at this point. There is also the pancreas. If Dr. Mallory was unkind enough to lay a trap for us, we may have an aneurysm in the abdominal aorta.

The transverse colon, the stomach and the pancreas are most likely to be the seat of this lesion. If it is malignant disease of the transverse colon the patient could have had these symptoms.

Perhaps the pain is not characteristic, but distention and subacute obstruction are consistent. At once we would go and get a story of her stools. We find a note that they were negative, although she said that she had passed fresh blood quite often for a good many years. In the absence of a proctoscopic examination showing that the blood came from high up we have to assume hemorrhoids. The stools were negative. With cancer of the colon, one of the common types, if we search long enough the stools do show some blood. We can have the scirrhus, constricting type of tumor with subacute obstructions with which bleeding may not be a prominent feature.

When we come to the stomach we immediately have something very definite, unless this is an other trap laid for the surgeon, by the x-ray man in this case. He speaks of a defect in the greater curvature of the stomach in the prepyloric area. Of course that suggests a tumor, and we can think of cancer of the stomach in spite of the symptoms and at once we look further to see if there is anything else to support this diagnosis. She has a tumor and an x-ray picture that shows that the stomach is involved. She has vomited, but the vomitus has never shown blood. Her stomach contents were negative for blood and so far as I can see the chemistry of the stomach is within normal limits and not such as you would expect to find in cancer, the most common tumor of the stomach. All this evidence is against cancer. All the other tumors, the benign tumors, fibromas and papillomas, may not show blood, and they are so rare that a surgeon may not make a diagnosis even at operation. It is usually made on microscopic examination of the specimen. So far as it goes you have to lay considerable stress on the x-ray picture, because in my experience the radiologist is very accurate about duodenum and stomach examinations. When it comes to the transverse colon and the descending colon I think it is only fair to say that they do not pick up the lesions there with the same accuracy and regularity that they do in the stomach. This case does show a defect, but that may be due to pressure from without the stomach. Where can it come from? It can come from a very large tumor of the transverse colon, but in that case if we had a bismuth enema it would show by x-ray. There is another organ that may show a tumor that presses on the stomach and that is the pancreas. It is possible that all these attacks were due to a low grade pancreatitis. She may have ended with a cystic tumor of the pancreas that is palpable. This woman may have had pancreatitis all the time.

I am frank in saying, and you probably suspect it by this time, that I cannot make a definite diagnosis in this case. I would advise just what was advised in this instance, exploratory laparotomy. If I had been the surgeon I should have made an upper abdominal left paramedial incision. If I found a negative colon I should

be a little disappointed. Then I would examine the stomach and if that were normal I should have a pained look, and if the pancreas went back on me I must say I should feel very bad indeed, I should say then that it just was not my day, and be prepared to find an aneurysm of the aorta and perhaps impacted feces in the transverse colon.

DR TRACY B. MALLORY: Dr Leland, you operated on this patient and can tell us your findings.

DR GEORGE A. LELAND: We went through the deliberations of a preliminary diagnosis very much as Dr Vincent has outlined and because it is necessary to be positive, according to the American College of Surgeons, we made a diagnosis of cancer of the stomach, realizing the atypical character of a great many of the symptoms.

We made an upper abdominal incision, just as Dr Vincent advised, and upon exploration we found the colon to be negative. We found the stomach to be negative. We could not be quite sure about the pancreas.

The positive findings: "Under avertin anesthesia the abdomen was opened through a median epigastric incision. When the abdomen was opened free clear straw-colored fluid was found and approximately one quart was removed by suction. Exploration showed a large retroperitoneal mass extending to the right of the mesentery and across the abdomen transversely, overlying the spinal column, at about the level of or just below the pancreas. There was also an additional mass running down an inch to the right lateral gutter. From this a biopsy specimen was removed. In the posterior culdesac of the pelvis there were several metastases. The fundus was retroflexed and represented the nodules felt by rectum. On the anterior aspect of the uterus was a small fibroid about two centimeters in diameter which probably had been mistaken for the fundus. The liver was enlarged and displaced downward. This low position seemed to be due to metastatic nodules about 4 centimeters in diameter in the middle of the right lobe. The gall bladder was distended and slightly tense. The stomach was large, flaccid, entirely free from any evidence of disease. In view of the extensive involvement in the abdominal cavity there appeared to be no indication for any operative procedure, accordingly the abdomen was closed."

We had operated on this patient with the hope that we should be able to relieve her of the apparent symptoms of high obstruction. With these findings we decided that her obstructive symptoms, vomiting, gastric stasis, were due to reflex rather than organic disease, so we closed the abdomen.

The preoperative diagnosis was carcinoma of the stomach. We were unable to determine from the operation where the cancer originated so our postoperative diagnosis was carcinomatosis.

FURTHER HISTORY

The patient developed postoperative abdominal distention. A gastric lavage on the tenth day yielded eighteen ounces. At the same time there appeared a slight icteric tint in her sclerae. The icteric index taken that day was 35 milligrams, as compared with 5 milligrams five days previously. There was recurrent vomiting of bile stained material. The jaundice was greatly increased. She failed rapidly and died three weeks after admission.

CLINICAL DIAGNOSIS

Carcinoma of the stomach

ANATOMIC DIAGNOSES

Scirrhus carcinoma of the cecum with metastases to the lungs, both adrenals, the liver and the retroperitoneal lymph nodes

Pulmonary thrombosis (tumor thrombi)

Obstruction of the common bile duct due to external pressure

Jaundice

Chronic pancreatitis

Ascites

Hydrothorax, bilateral

Fatty vacuolization of the liver

PATHOLOGIC DISCUSSION

DR MALLORY: The autopsy showed carcinomatosis and the question came up as to where the primary lesion was. At the time of autopsy we found cancer involving the cecum, the ascending colon and the transverse colon. The entire pancreas was very large, firm and hard, although on section the structure seemed fairly normal.

The mass which had been felt on the posterior surface of the uterus appeared to be really the fundus of the uterus, which was tipped over backward, and there was a metastatic nodule of cancer on the anterior surface just about the size and shape of a fibroid. That was not determined until the microscopic examination was made.

At the time of autopsy we thought that the cancer was primary in the pancreas. When the microscopic sections came through, however, we found a perfect shell of cancer around the pancreas but no tumor in the pancreas at all. The one lesion with the characteristics of primary tumor was the one in the transverse colon, though this was bound so firmly to the pancreas that the surgeon had no chance of recognizing it.

A PHYSICIAN: Do you think there was enough in the colon to show with the barium enema?

DR MALLORY: I should expect at least some deformity would have been present. I hasten, however, to exonerate our X-ray Department. The x-ray examination in this case was done outside the hospital.

Journal of Medicine

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MASSACHUSETTS, WHITHER GOEST THOU?

THE 1932 Report of the Massachusetts Board of Registration in Medicine* has been published recently and challenges comparison with the Report for 1931. The number of candidates examined rose from 383 to 433, the number registered after examination fell from 213 to 208, the percentage of failures on examination rose from 44 to 51. The number of diplomates of the National Board of Medical Examiners who were registered rose from 40 to 55. These figures do not tell the whole story and the report deserves closer analysis.

Leaving out of consideration the European schools, of which few graduates appeared in either year, and accepting the usual classification of schools employed outside of Massachusetts, one finds some interesting results of computations based on figures given in the report

In 1931, 211 graduates of approved schools were examined, 11 or five per cent failed, and 200 or 95 per cent passed. From the nonapproved schools, 125 graduates were examined, of whom 36 or 28 per cent passed, and 89 or 72 per cent failed.

When one turns to the corresponding figures for 1932, one finds there was a falling off of 41 in the number of graduates of approved schools who took the examination and an increase of 130 in the number of graduates of nonapproved schools. The loss in the former group is offset in part by an increase of 15 in the National Board diplomates, making a net loss of 26. No graduates of nonapproved schools are admitted to the National Board examinations. The percentage of failures for 1932 rose for the approved group from five to 13, and for the non approved group from 72 to 78.

Among the 55 candidates from the nonapproved group who were registered were 16 osteopaths, who might have been registered as such in some other states, but in Massachusetts the osteopath registered under present conditions, practices on the same basis, with the same freedom to select and administer any therapeutic procedure of major surgery, as does the holder of the degree of doctor of medicine. So it is clear that there were registered in Massachusetts in 1932, 39 physicians who would not be admitted to examination in any other state. That is to say, approximately 15 per cent of those who were admitted to practice in 1932 would not be even admitted to examination in any other state.

There is no warrant for drawing far-reaching conclusions from a comparison of two consecutive years, but the figures are suggestive of certain trends. In the first place, there is a steady increase in the number of National Board diplomates who enter practice in Massachusetts. It is to be hoped that in future reports the Massachusetts Board will list the schools from which these diplomates come. In the second place, there seems to be an increase in the difficulty of the examination since the percentage of failures has increased. Perhaps the examinations should be made still more searching as the statute prescribes that they shall be sufficiently thorough to test the fitness of the candidate to practice medicine. In the third place, there is a doubling in the number of applicants from the nonapproved schools and a falling off of graduates from the approved. But what stands out in most striking fashion is that, of the physicians actually licensed to practice, the percentage who came from nonapproved schools rose from 13 in 1931 to 21 in 1932. There was a corresponding falling off in the graduates of the approved schools. This is not brought out by the Board but is clear from the figures in the report. Is the Board giving the people of the Commonwealth the protection they should have?

HEALTH, PAST AND PRESENT

DESPITE the continued economic distress, the year 1933 presented us with a deathrate which was either the lowest or very near to the lowest of all time, with progress in the control of the preventable diseases continuing unabated. Man is but mortal, however, and those who did not die in 1933 must die sometime, we cannot expect the deathrate to go steadily and continually lower.

Moreover, as the statistical bulletin of the Metropolitan Life Insurance Company points out, the beginning of a new year is more than an opportunity for gratification over past performances, it is also a good time to look forward to future responsibilities. As the economic depression slowly lifts, there is danger that we may enter into a period of health depression. Renewed industrial activity will mean an increase in the number of those exposed to occupational hazards. With increased employment will come decreased leisure and less out-of-door recreation. Human values may be overlooked with increased industrial occupation.

Most important of all, perhaps, are the curtailments which have been made in public health expenditures. Will we be content, as the *Bulletin* states it, to maintain our health machinery in its present restricted fashion, or will there be an expansion of necessary health services as our increased financial resources permit?

Knowledge is available to add to the length of life, if we would but use it. We can rid ourselves completely of typhoid fever, yet we have each year over 4,000 deaths from this cause, and ten times that number of cases. In 1933 there were 4,000 deaths from diphtheria—a preventable disease—and nearly 60,000 cases. Infantile diarrhea has taken a toll of 14,000 babies, most of these deaths could have been prevented, as could many of the fifty-odd thousand deaths from diseases of early infancy. The victims of tuberculosis numbered over 70,000, and the complications of pregnancy took the lives of more than 13,000 women. Over 85,000 fatalities were due to accidents. In all, these and other preventable causes account for the loss of nearly a quarter of a million lives.

The prevention of such deaths in 1934 will depend largely on the extent to which the public health and public safety programs of our country are enabled to carry on with sufficient funds and adequate personnel. Fairly adequate health service cannot be supplied at less than \$1.00 per capita per annum, which was the approximate expenditure in 1930. The standard set by the American Public Health Association is \$2.00. The present expenditure is close to seventy cents per annum. Let him who runs, read

THE PERIODIC HEALTH EXAMINATION

IN 1922, some fifty years after it was first suggested, the American Medical Association endorsed and recommended the practice of periodic health examinations. In spite of further endorsements and large amounts of propaganda, its practice is still far from universal. Although it numbers many conscientious physicians among its proponents, it has not as yet been standardized. There has been a paucity of real scientific contribution to the subject during the past twelve years. More recently actual dissenters have arisen to challenge the claims made by some of those who would thus supervise our health. The Committee on Public Health has been led to study the subject and publishes a report on page 226 of this issue of the *Journal*. Unanimity of opinion regarding the Committee's conclusion can hardly be expected. The subject, however, is timely.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

JACKSON, HENRY, JR. A.B., M.D. Harvard University Medical School 1919. Assistant Professor of Medicine, Harvard Medical School. Associate Physician, Thorndike Memorial Laboratory, Boston City Hospital. Associate Physician, Collis P. Huntington Memorial Hospital of Harvard University. Address: Thorndike Memorial Laboratory, Boston City Hospital, Boston. Associated with him is

MERRILL, DUDLEY A.B., Harvard University Medical School 1930. Assistant in Medicine, Harvard Medical School. Assistant Resident, Thorndike Memorial Laboratory, Boston City Hospital. Assistant Visiting Physician, Pondville Hospital, Wrentham, Mass. Address: Thorndike Memorial Laboratory, Boston City Hospital, Boston. And

DUANE, MARION. Blood Technician, Thorndike Memorial Laboratory, Boston City Hospital. Address: Thorndike Memorial Laboratory, Boston City Hospital, Boston. Their subject is "Agranulocytic Angina Associated with the Menstrual Cycle." Page 175.

THOMPSON, W. P. M.A., M.D. Columbia University College of Physicians and Surgeons 1924. Instructor in Medicine, Columbia University. Assistant Physician, Presbyterian Hospital, New York City. His subject is "Observations on the Possible Relation Between Agranulocytosis and Menstruation with Further Studies on a Case of Cyclic Neutropenia." Page 176. Address: 620 West 168th Street, New York, N. Y.

ADAMS, JOHN D. M.D. University Medical School 1902. F.A.C.S. Instructor in Ortho-

pedic Surgery, Harvard Graduate School of Medicine and Tufts College Medical School Orthopedic Surgeon-in-Chief, New England Medical Center Consulting Orthopedic Surgeon at Beverly Hospital, Beverly, Lawrence General Hospital, Lawrence, Jordan Hospital, Plymouth and Melrose Hospital, Melrose His subject is "Mechanics and Reduction of Displaced Upper Femoral Epiphysis" Page 178 Address 43 Bay State Road, Boston

SIDEL, NATHAN M.D. Harvard University Medical School 1923 Associate in Medicine, Beth Israel Hospital, Boston. Junior Visiting Physician, Boston City Hospital Instructor in Medicine, Tufts College Medical School Address 483 Beacon Street, Boston Associated with him is

ABRAMS, MAURICE I. A.B., M.D. Harvard University Medical School 1930 Assistant in Medicine, Beth Israel Hospital, Boston, and Tufts College Medical School Address 475 Commonwealth Avenue, Boston. Their subject is "Jaundice in Arthritis, Its Analgesic Action" Page 181

OSGOOD, ROBERT B. A.B., M.D. Harvard University Medical School 1899 F.A.C.S. John B. and Buckminster Brown Professor of Orthopaedic Surgery Emeritus, Harvard. Member of Consulting Board, Massachusetts General Hospital Consulting Surgeon, Boston Children's Hospital His subject is "The Theology of Medicine" Page 182 Address 372 Marlborough Street, Boston.

ROOT, HOWARD F. See page 44, issue of January 4, for record of author His subject is "The Association of Diabetes and Tuberculosis IV Treatment, Prognosis, and Prevention" Page 192

PECK, MARTIN W. B.S., M.D. Harvard University Medical School 1915 Instructor in Psychiatry, Harvard Medical School. Formerly Chief of Out-Patient Department, Boston Psychopathic Hospital President, Boston Psychoanalytic Society His subject is "The Application of Psychoanalytic Concepts to General Psychotherapy" Page 207 Address 520 Commonwealth Avenue, Boston

The Massachusetts Medical Society

THE PERIODIC HEALTH EXAMINATION

A COMMUNICATION FROM THE COMMITTEE ON PUBLIC HEALTH

Some eight years ago the Committee on Public Health issued a Handbook for Health Examinations by Physicians. The personnel of the Committee has since changed to such an extent that we may now refer to this Handbook with modesty as an excellent

presentation of the technical aspects of the subject. The hopes and doubts which surround its clinical aspects, however, have led us to restudy the problem. The purpose of this communication is to record certain ideas concerning the value of the Periodic Health Examination which seem to have arisen in the minds of many thoughtful physicians during the past decade.

With this in mind a circular letter addressed to the members of the Council of the Massachusetts Medical Society and a few others known to be particularly interested brought fifty-odd replies dealing with all phases of the subject. There are still those of the "stitch in time" philosophy who see in the periodic health examination the instrument of an hygienic millennium. On the other hand are those who would consider such a millennium (like Henry Tudor, when asked what he would think of another marriage) as "a remarkable triumph of optimism over experience."

On the whole, but with many qualifying reservations, the physicians replying to our letter declared themselves as believing in the value of periodic health examinations. In several instances, after expressing this orthodox belief, the writer added a sentence such as the following "Curiously enough, I seem to recall more instances where such examinations failed in the sense that they did not reveal early malignant disease which soon thereafter made itself manifest, than I do instances where such examinations led in symptom free patients to the discovery of a condition which required operation." A fear of clinics or of State Medicine dominated seven replies. Seven considered the health examination a more or less futile gesture. Six clearly recognized the limitations of our knowledge and ability. Four felt that a more adequate definition or conception of what constitutes a health examination is needed. Four felt that further promotion or "selling" is called for. Two very thoughtful correspondents believed that further promotion would be unwise at this time—basing this belief on present economic conditions. Two thought that clinic facilities should be available to any physician who undertakes health examinations and two more did not feel it was worth while to compete with the insurance companies and the Life Extension Institute. One stated that health examinations should be available to all, whether or not they were able to pay for them. A list of excerpts from these letters is appended to this communication.

DISCUSSION

When disease is diagnosed in its advanced and perhaps hopeless stages it is an easy matter to look backward and to speculate upon what might have been done—had we only known—but it is speculation at best. It is no easy matter, on the other hand, to look forward and prophesy the future of vague thoracic pain indigestion or cough. Nor will it always help in such forecasting to spend relatively large amounts of money on x ray, electrocardio

graphic or biochemical studies. The wise physician has learned to be cautious about telling any middle-aged person that there is nothing the matter with him. He also knows that many individuals who have been branded with chronic disease outlive their normal life expectancies. He is interested in early diagnosis but he cannot allow himself to be carried away by generalities.

An appreciation of the human constitution—and a respect for it—is essential to all honest attempts to “keep well people well.” The environmental pressures which break one person will not affect another. The resistance to these pressures is largely inherited and entirely beyond our control. Our knowledge is insufficient to greatly help us in the analysis of constitutions but the point should be borne in mind that each individual has his own tendencies—if not his destiny. In this regard a study of family histories is often revealing.

Measurable evidence of the onset of chronic disease may sometimes be secured before symptoms are manifest, but nature usually masks it by adjusting the habits of the body to its decreasing capacities. In middle age, for example we have ceased to turn handspikes or to throw ourselves into sudden physical exertion on slight provocation. It is only when we try to beat our children on the tennis court or mountain climb that we realize our natural limitations. These natural limitations, however, are evidence of a natural cardiovascular degeneration. If we live long enough these natural degenerations become chronic diseases. When is the healthy person to be so labelled? Each must answer the question for himself. We can do very little about it.

The physician is more embarrassed by unforeseen death than by any other incident in his practice. The “specialist in health examinations” has avoided this reality because he is rarely willing to go when ever and wherever called, or to leave “that fascinating game of piecing together bit by bit a diagnosis built up from trifling and apparently unrelated deviations from the normal.” Nevertheless, unforeseen death occurs and if our set ups, check ups and follow ups cannot prevent it, this fact must be plainly made known to the people who are buying health examinations.

The separation of functional from organic symptoms is a very difficult exercise at times. Yet trivial symptoms and signs provide the earliest possible clues to disease. They have the tremendous advantage of localizing the search and of providing tangible clues to be followed. Those who have a flair for phraseology may call them preclinical signs and symptoms but until they appear we have no definite ground on which to guard against the future.

When trivial signs and symptoms have appeared the subject becomes a patient—to be thoroughly investigated and dealt with like any other patient. Here would seem to be the logical and legitimate field of the “health examination”—for people who

have recently acquired trivial complaints—the little sores and lumps—the trifling indigestions—these can be analyzed or dismissed, with a tangible clue to interest the physician and with promise of worthwhile results to interest the patient. In the absence of such localizing symptoms or signs it would seem wasteful to spend time and money on extensive laboratory or other investigation. The Committee could obtain no data on the usefulness of these expensive maneuvers for well people and is inclined to consider them of no practical value and a needless expense.

Inasmuch as our fellow men are dying at all ages we thought it might be helpful to review the causes of death in Massachusetts, in relation to our ability to foresee such death. Figures for the proportionate mortalities at various ages in men and women were kindly furnished by the Department of Adult Hygiene at the State House. These have been cast into the chart forms which are presented herewith—one for men and one for women. The width of the band (not its position or direction across the chart) represents the prevalence of each cause at each age. Thus we may see at a glance what eighty per cent of the people may be expected to die of.

For the present let us assume that our subject for health examination comes to us thinking he is free from disease. He has no indigestion, he has no chronic sores, he sleeps well, eats well and has no incapacities of which he is aware. Now let us look at the charts and see what he is apt to die of.

At most ages, in both men and women, there is a 7 or 8 per cent hazard of death by pneumonia. Nothing that we can do or say will much change that. When he gets pneumonia we must act quickly, but until then we can do little more than caution him to take care of upper respiratory infections, especially during their later stages, and especially if he is a fresh air enthusiast.

Next comes cancer, one of the most quoted examples of prevention. In spite of the fact that it kills a goodly proportion of men, the Metropolitan Insurance Company did not once encounter it in 16,662 health examinations of its male policyholders. The individual health examiner will therefore not encounter it once in a lifetime. In women this hazard is greater in middle life and a thorough pel-

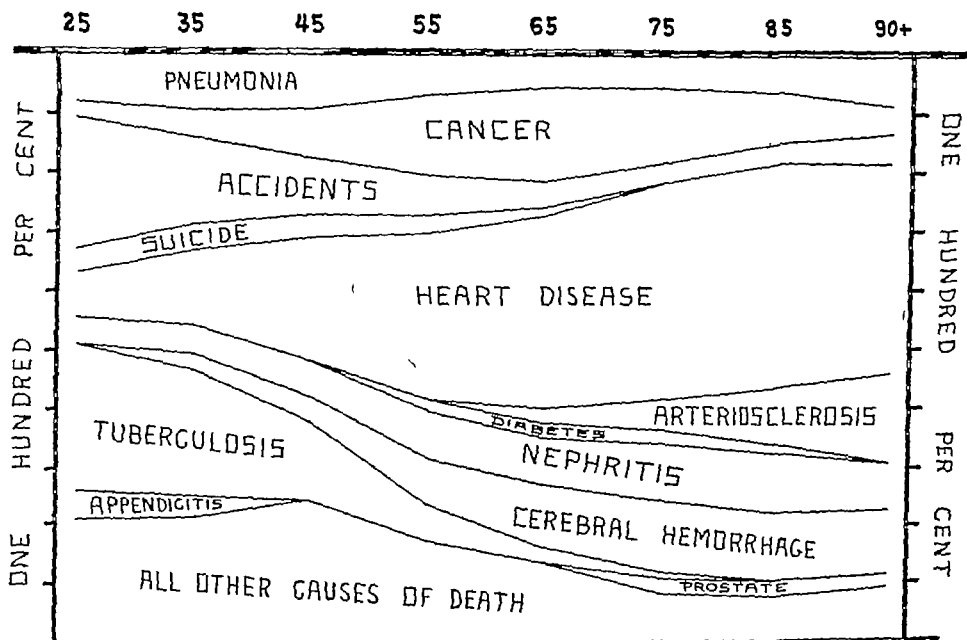
The Committee has consulted several gynecologists to ascertain what the minimum requirements for pelvic examination should be. Apparently all women not virgins should not only have a bimanual examination, but should also have their cervixes inspected about once a year. In the earliest stages of cancer of the cervix there is neither tactile nor visual evidence of pathology. Cancer may nevertheless be specifically ruled out by painting the cervix with Lugol's solution (Schiller's test) which stains the normal glycogen containing epithelium a dark mahogany color. If the entire portion is so stained the test is negative. If there are areas which do not take the stain the test is positive. In the positive cases the precise points for taking tissue for biopsy are indicated and of the positive cases more than ten per cent prove to be actual cancer. Many of the remaining positives should receive treatment. The outstanding value of the test however is that the complete staining reaction is specifically negative.

The Committee believes that any physician undertaking health examinations in women should familiarize himself with this test. For fuller information the following reference is given: The Detection of the Clinically Latent Cancer of the Cervix. Graves, W. P., Surg. Gynec. Obst., LVI, 2A, pp. 317-322, Feb. 15, 1933.

vic examination is one way we can hope to reduce it. (See footnote, page 227) A pelvic examination of all women in middle life is therefore called for, and, with careful palpation of the breasts That is

Diabetes, Nephritis and Cerebral Hemorrhage. The charts as well as our clinical experience remind us at once that this is a formidable group, increasing as a proportionate cause of death from about 13

PROPORTIONATE MALE MORTALITY BY AGES IN MASSACHUSETTS, 1930-32

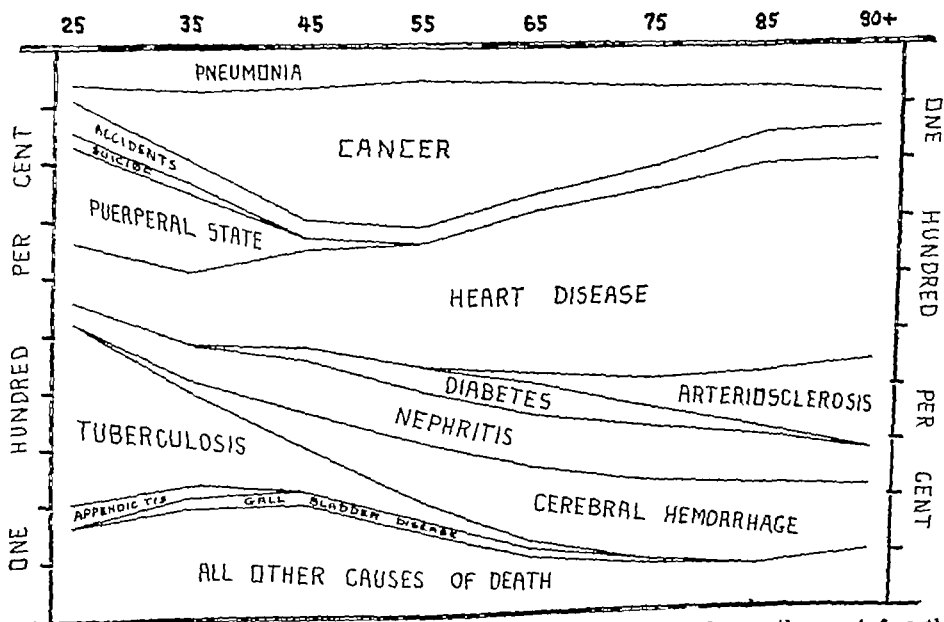


about all we can do about cancer in this hypothetical person—male or female

Deaths by accident we can do nothing about. When potential suicides consult us they are not

per cent at 25 to 70 per cent at 80 years of age. Telling these people to breathe deeply and have a bowel movement every day isn't going to promise much. We may investigate their constitutional pat

PROPORTIONATE FEMALE MORTALITY BY AGES IN MASSACHUSETTS, 1930-32.



well people. The puerperal state is not a consideration during a health examination.

We next come to the group of circulatory diseases, including Heart Disease, Arteriosclerosis

terms but we cannot change them. A few things we can do—we can keep them from getting overweight, we can examine their urines, we can measure their blood pressures. What advice we should give to the

borderline cases of hypertension for example must remain a matter of the knowledge or philosophy of the individual physician and patient

Next on the list is tuberculosis Early diagnosis is all that we can strive for This means (1) history of contact, (2) tuberculin reaction and (3) x-ray plate Should these be incorporated into the routine health examination? If the history is positive yes —if not, no unless the subject is of the asthenic or hypotensive constitutional type

The remaining causes of death are so small and diversified that they need not be discussed We have covered, so far as possible, eighty per cent of all deaths at all ages

Is the health examination worth while? On this point there is honest difference of opinion A lecturer, seeking to interest a lay audience, is tempted to be visionary and unequivocal The lecturer refers his hearers to their family physicians The physician seeking to deal with the realities of life is tempted to be brusque, particularly when he is accosted by a well known neurasthenic patient The lecturer will point to the studies of certain Life Insurance Companies, who say there are only about eighty deaths among policyholders who took health examinations for each one hundred deaths among those who did not take them The physician, being very close to the problems of many people, will point out the distrust in which insurance companies are held by many people The person who is conscious of having shown physical or chemical abnormalities will naturally shrink from having them confirmed, or in giving any insurance company a chance to obtain data that might rate him up in the event that he should wish to increase his insurance holdings

Somewhere between the two extreme attitudes is a middle-ground that we may all strive to agree upon, or perhaps many of us could subscribe to the following

SUMMARY

1 The Periodic Health Examination is a procedure which will occasionally reveal early remedial diseases It is a luxury and should be paid for as other luxuries The Committee believes it is unwise to promote it in any other light or put a price upon it, particularly at this time

2 Any intimation that it guarantees future health or life is unwarranted.

3 If attempted it should consist of the equivalent of the usual insurance history and examination plus when indicated

a Blood serum reaction for syphilis

b Pelvic examination in women (See footnote page 227)

c X-ray picture of the chest.

4 The examiner should preferably devise and use his own record forms

5 The examination provides an opportunity to discuss the hygienic habits of the individual and to educate him in the value of investigating any

recently acquired trivial signs or symptoms From this leads our

CONCLUSION

That universal investigation of recently acquired trivial signs and symptoms by the family doctor would be more profitable than the periodic health examination, and that it should be substituted for the periodic health examination in future propaganda

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- 1 Garland J A handbook for health examinations by physicians Boston M & S J 193 947 (Nov) 1945
- 2 Dublin, L I Fisk, E L., and Kopf, E W Physical defects as revealed by periodic health examinations Am. J. M. Sc. CLXX, 4 October 1925
- 3 Fisk, E L Possible extension of the human life cycle Annals of American Academy of Political and Social Science CXLV September 1929

EXCERPTS FROM LETTERS ABOUT THE HEALTH EXAMINATION RECEIVED BY THE COMMITTEE ON PUBLIC HEALTH

On the whole, I am in favor of these examinations and believe that their usefulness depends on the skill, conscientiousness and tact of the physician, as is the case with his other professional activities

In regard to the health examinations my feeling is that they are potentially of enormous value and actually have been very disappointing

The critically important thing is I think, for doctors to receive sympathetically those seeking the health examination Any other attitude is going to drive these people to the quacks

It seems to me the remedy is really more public education and contact with the private practitioner than any fixed notion of a yearly overhauling

Health examinations—with the necessary reports and advice—should be looked upon by the general practitioner as a "Major" Medical problem and should be charged for accordingly In competition is the Life Extension Institute which allows the doctor a fee that is entirely inadequate to thorough and good work.

Doubtless the physician in general is reluctant to insist upon such examinations among his patients for fear they might misjudge his motive as being that of soliciting paid services

I should favor the Society going on record as to the value of health examinations Further than that I think it would be futile to go, for you can't go far enough to assure even an approach to universal excellence, in the profession, or universal adoption by the laity

I do not pretend that I can head off cardiovascular renal degenerative diseases but I am convinced that intelligent guidance may avoid many discomforts and help them to carry on longer than they otherwise would

We wish it were possible to sell the idea to more people outside of the introspective group, however the principle is good, therefore we believe should be carried on with as much optimism as possible

There is merit to periodic health examinations or the matter would have passed as a fad by this time

Like other health promotion projects the "high pressure" methods to sell it to the public have been tinged with charlatany. The results have doubtless been beneficial to insurance companies and have also produced other pecuniary benefits, but the medical profession has been placed in the position of pretending to do something which it cannot do.

If he has discomfort or symptoms which lead him to consult a physician of his own accord 'tis well, he may if you please be urged so to do with out delay, but it is to be hoped that even then he will fall into the hands of a physician of experience, tact and good judgment, and honest withal.

I feel convinced that at the present time a considerable amount of money is spent on these so-called health examinations for results which are far from satisfactory.

I have seen cases of hopelessly advanced malignant disease of internal organs in patients who had passed a successful health examination within six to twelve months.

The idea has to be "sold" to the people and at the present time I do not think many are in a position to pay more than is absolutely necessary.

Probably it is safe to say that every member of the Council of the Massachusetts Medical Society has reached the "cancer age." How many Councillors do you believe have ever been examined for possible rectal or prostatic (or uterine) cancer in its early stage?

MISCELLANY

A RESUMÉ OF THE REPORT OF THE COMMITTEE APPOINTED BY THE NORFOLK DISTRICT MEDICAL SOCIETY

The Committee on Dr Landesman's Resolutions after two months work brought in a more or less detailed report comprising twenty pages which was read to the Norfolk District Medical Society at the special meeting in December. The following is a brief résumé of this report.

The Committee visited the principal hospitals and dispensaries of Boston, also the Community Nursing Association and Health Centers. We interviewed a number of the large insurance companies and visited their clinics. We conferred with the Massachusetts Bar Association, the Massachusetts Claim and Investigating Committee, and with Mayor Elect Mansfield. Our reception was cordial and coöperative wherever we called.

We found that there was a vast amount of charity work being done by the various institutions. The sum total was estimated at approximately a million and a half outpatient treatments per year. It also appears that the Boston City Hospital will take

care of about 4000 maternity cases and the Boston Lying In Hospital approximately 2000.

We found many of the institutions to be greatly overcrowded and taxed beyond their capacity. We found the clinics of the various insurance companies to be treating from 45 to 150 patients per day. The various companies would have the Committee believe that they were willing to coöperate with the physicians provided certain alleged abuses of the physicians by the companies would be corrected.

The Committee believes that the City Hospital is being imposed upon more than any other hospital and believes that the political situation is at the bottom of it.

We find Mayor Mansfield very much interested and willing to coöperate.

The conclusions of the Committee are that a large amount of work is being diverted from the general practitioner by and through these various institutions, and that this source of revenue can be directed back to where it belongs if the proper kind of corrective measures are brought to bear. We are also led to believe that the physicians themselves are greatly to blame for the diversion of a great deal of this business. We believe that the charitable hospitals and dispensaries which are being overcrowded will welcome relief from this situation.

While the insurance companies all assured us of their willingness to coöperate with the physicians, we are convinced that they are primarily interested in saving money for their companies and that it is up to the medical profession to convince them that, by the coöperation which the physicians wish to obtain, they will not only not lose money, but gain by so doing.

The Committee also believes that it is absolutely necessary to get full coöperation and assistance from City Hall through the Mayor's office to eliminate political abuse of the facilities of the City Hospital.

Some of the recommendations from the Committee are as follows:

1. Devise some system which will provide a uniform method whereby the indigent sick may apply for and receive free treatment from various Boston institutions.
2. Procure the coöperation of the Mayor of Boston on rules, regulations, or legislation that will prevent anyone not eligible for free treatment from receiving it through the influence of politics.
3. No person shall be given free treatment in an institution supported by the taxpayers except in absolute emergency, without having first complied with the method which is to be determined under recommendation No 1.
4. That physicians in general be more careful and more discriminate in their habit of sending patients to charity hospitals for free treatment.
5. All charity hospitals shall provide a large sign stating that "free treatment in this institution is

for the indigent only' until some permanent method is devised which will make this unnecessary

6 That a Committee be appointed for the purpose of achieving if possible, changes in the Industrial Act, so that a staff doctor may receive payment for services rendered in cases coming under this act

7 That a Committee be formed to determine some definite, permanent, and satisfactory method whereby hospitals, doctors, and nurses will be assured of the payment of their bills in tort cases when and if, the claimant receives damages

8 That the Medical Society instruct the various insurance companies to report any misdeeds or alleged misdeeds of any physician direct to the Society first and from there if necessary, it can be taken to the State Board of Registration in Medicine

9 That night pav clinics and baby clinics be abolished

Respectfully submitted,

CHARLES MALONE, M.D.

H. M. LANDESMAN, M.D.

A. J. SHADMAN, M.D., *Chairman*

AN HONOR CONFERRED ON DR JOHN W BARTOL

In the report of the operations of Simmons College for 1932-33, the name of Dr John W Bartol appears as chairman of the Corporation.

THE PUBLIC PAYS HALF THE COST OF MOTOR VEHICLE INJURIES

Mr Dudley Harmon executive vice-president of the New England Council has stated in a report on street and highway safety that the public is paying half the bill for motor vehicle injuries in Massachusetts

This estimate is based on hospital statistics which show that in one year the non fatal accidents alone imposed hospital charges of more than \$2,000,000 and that only about fifty per cent are collectable

It seems strange that hospitals and physicians have not united in an attempt to lessen this burden.

RECENT DEATHS

SADLER—ROY ANGELO SADLER, M.D. of 1075 Boylston Street, Boston, died January 18, 1934 after a protracted illness

He was born in Milford Massachusetts August 27 1882 the son of Albert Fiske Sadler and Mrs Jane Hodges (Blunt) Sadler

He was educated at Phillips Exeter Academy and Harvard College and received his degree in medicine from the Harvard Medical School in 1907 He served as house physician at the House of the Good Samaritan, the Massachusetts General Hospital and the Children's Hospital. Later he spent four months in Europe and since then practiced in Boston He served on the staff of the Boston Dispensary in the

children's department and as district physician. During the World War he served at Camp Greenleaf, Georgia, as a first lieutenant of the Medical Corps

He joined the Massachusetts Medical Society in 1911 and was also a Fellow of the American Medical Association He was a member of the New England Pediatric Society, the Zetland lodge of Masons, and the Square and Compass Club He is survived by his widow who was Agnes M Phelps of Newton

PAUL—SOCRATES J PAUL, M.D., died in the Health Department Hospital of Springfield Massachusetts, January 9, 1934 He was a graduate of Tufts College Medical School and after practicing in Haverhill Massachusetts, for a time moved to Springfield where he had practiced up to the time of his decease

He was prominent in Greek circles He leaves his widow, a son, a daughter, and a brother

OBITUARIES

ARTHUR LAMBERT CHUTE, M.D

Dr Arthur Lambert Chute of 350 Marlborough Street Boston, died at his home on January 12 1934 of heart disease For the preceding six months he had been in poor health He is survived by his widow, who was Eliza Robinson Swift, a son Dr Richard Chute, who is on the staff of the Massachusetts General Hospital, a daughter, Mrs Samuel McMurtrie, Jr of New York City and another son, Oliver Swift Chute of Whitinsville

Dr Chute was born in Georgetown Massachusetts, August 12 1869 the son of Richard H. and Susan Rebecca (Nelson) Chute His childhood was spent in Eau Claire Wisconsin, where his grandfather had entered the lumber business shortly after the Civil War

He attended Beloit College and after a trip abroad entered the Harvard Medical School, from which he was graduated in 1895 He was a house officer at the Massachusetts General Hospital, and after a few years spent in general surgical practice he began to specialize in urological surgery He was one of the first physicians in Boston to become proficient in the use of the cystoscope, and one of the first to confine his work to urology In 1905 he became a member of the staff of St. Elizabeth's Hospital and served in that capacity until one year ago Much of his private work was done at the Phillips House, the Corey Hill Hospital and the Brooks Hospital he was urological consultant to many smaller hospitals For many years he was associate professor of urology at Tufts College Medical School

Dr Chute's contributions to medical literature were many for he was as industrious in his writing as in his practice His communications were usually based upon his extensive experience, and were highly regarded because of their sound reasoning

and their excellent style. The esteem in which he was held by his fellows is evidenced by the offices to which he was elected. He had been President of the New England Branch of the American Urological Association, Chairman of the Section of Urology of the American Medical Association, President of the American Urological Association, the American Association of Genito Urinary Surgeons, the Clinical Association of Genito Urinary Surgeons, and a member of the Société Internationale d'Urologie. He was a member of the St Botolph Club, The Country Club, Union Boat Club, the Harvard Club, the Roxbury Clinical and Record Club, the New England Surgical Society, the American College of Surgeons and the Boston Surgical Society.

This is a brief outline of Dr Chute's career, but the greater part of the story has not been told. Only those who know his work, and the multitude of ill people whom he brought through the valley of the shadow of death, could realize with what devotion he attended to the details of his very large practice. With him, nothing took precedence over the welfare of his patients. His work was characterized by its thoroughness, he was conservative, and his voice was often heard in condemnation of new departures about the wisdom of which he was in doubt. Yet when he became convinced of the value of a new idea, he was quick to apply it in his work. His contributions to medical literature were concerned not so much with new and original suggestions as with standardizing and consolidating advances already made. He was one of the first to appreciate the value of hypodermoclysis in urological surgery, and his early adoption of the two-stage method in prostatectomy enabled him to save many lives which would otherwise have been lost.

His sense of humor was keen, he thoroughly enjoyed his patients and never confined his visits to purely perfunctory contacts. His wisdom, his caution, his rigid adherence to the highest ideals of medicine made him a forceful factor in the development of urology in this country. His geniality endeared him to his fellow physicians and to his patients. His place will be difficult to fill.

JOSHUA C HUBBARD, M.D

In the death of Dr Joshua C Hubbard this community lost a surgeon of rare character, and extraordinary skill. In spite of his own modest estimate of his attainments, his skill made him a marked man among his fellows, and as a result he was chosen by many of them if they needed an operation on their own families. His character was marked by sincerity and patience. No one ever saw him flustered and embarrassed, no matter how many his annoyances were. He operated skillfully and quickly, and with a minimum of tools. His patients did well. He had special training in obstetrics, and his knowledge and skill in that specialty were great. He was one of the few who combined an obstetric practice with successful work in many fields

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When some eight years ago he became subject to chronic and gradually increasing infirmities he bore them with patience and without complaint, heavy and disabling though they were and continued his teaching even after he was unable to do much actual operative work.

His life and character have always been a model and an inspiration to those who knew him. He was an example of what we all ought to strive to

achieve Great was the benefit of his skill and kindness to his patients, and his character ennobled the profession of which he was a conspicuous ornament

F B L

NOTICES

AN ADDRESS BY PROFESSOR LEONARD CARMICHAEL

Professor Leonard Carmichael of Brown University will speak at the State Hospital for Mental Diseases Howard R. I., on 'Development of Behavior Before Birth' illustrated with motion pictures on Monday January 29, 1934 at 8 15 P.M.

JACOB KASANIN M.D., *Clinical Director*

RADIO HEALTH MESSAGES

JANUARY-FEBRUARY MARCH, 1934

Sponsorship Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.

Courtesy WBZ Fridays, 4 30 P.M.

Jan.

26 The Common Cold

Feb

2 What A Parent Should Know About Measles
9 Milk

16 Stomach Trouble

23 Lumps in the Neck

March

2 Age and Cancer

9 Some Problems of Epilepsy

16 Fractures

23 How to Keep the Well Child Well

30 Résumé of the Year's Work

EDITORIAL NOTE Attention has been called to a change in the program by the National Broadcasting Co of which we had no notice

The broadcast message for January 19 was cancelled.

The remaining schedule will be carried out we are assured, and the subject of Hypertension will be dealt with later

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health. Fridays 4 40 P.M.

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEL. Fridays 5 00 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum State Department of Public Health, State House Boston.

SPECIAL

From Friday January 19 the State House Broadcasts were discontinued and in their place were substituted Ten Minute Health Reviews

Sponsored by the Massachusetts Department of Public Health. Assisted by Miss Violette Babcock, Violinist, and Mr G Lambert Roscoe, Pianist and Organist.

Courtesy WEEL Fridays, 1 15 P.M.

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health, Blended with Classical Music.

After hearing this new program we would appreciate your comments

NOTICES OF MEETINGS

NORFOLK DISTRICT MEDICAL SOCIETY

A regular meeting of the Norfolk District Medical Society will be held in the Roxbury Masonic Temple, January 30, at 8 15 P.M. Telephone Garrison 9492

Business

Communications

"Certain Disorders of the White Blood Cells"
The Aetiology of Anemia.

Dr William Dameshek—Dr M B Strauss

Collation.

FRANK S CRUCKSHANK M.D., *Secretary*

1695 Beacon Street, Brookline

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinical conference of the New England Hospital for Women and Children will be held at the hospital Dimock Street, Roxbury, in conjunction with the staff meeting on Thursday, February 1 at 7 30 P.M. The following cases will be presented and discussed Two Cases of Congenital Heart Anomaly in New Born Infants Cancer of the Breast with Lung and Bone Metastases

ALICE H BIGELOW, M.D., *Secretary*

NEW ENGLAND DERMATOLOGICAL SOCIETY

The next meeting of the New England Dermatological Society will be held on Wednesday, February 14 at 3 P.M. at the Massachusetts General Hospital.

J HARPER BLAISDELL, *Secretary*

HAMPDEN DISTRICT MEDICAL SOCIETY

The regular Winter Meeting of the Society will be held in the rooms of the Springfield Academy of Medicine, 20 Maple Street, Springfield on Tuesday, January 30 at 4 15 P.M.

PROGRAM

The Aschheim Zondek Test in Pregnancy Dr George L Schadt.

Fainting Due to Cardiovascular Causes Dr Soma Weiss of Boston.

Discussion by Fellows

Dinner at 6 P.M. at expense of Society

HERVEY L. SMITH M.D., *Secretary*

and their excellent style. The esteem in which he was held by his fellows is evidenced by the offices to which he was elected. He had been President of the New England Branch of the American Urological Association, Chairman of the Section of Urology of the American Medical Association, President of the American Urological Association, the American Association of Genito-Urinary Surgeons, the Clinical Association of Genito-Urinary Surgeons, and a member of the Société Internationale d'Urologie. He was a member of the St. Botolph Club, The Country Club, Union Boat Club, the Harvard Club, the Roxbury Clinical and Record Club, the New England Surgical Society, the American College of Surgeons and the Boston Surgical Society.

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Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C Guy Lane 416 Marlboro Street, Boston, for details

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnitz. General Secretary Dr H. E. Walther, Gloriastrasse 14 Zurich.

September 3 6—American Public Health Association, at Pasadena, California. Dr J D Dunshee, Chairman Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association 450 Seventh Avenue, New York, N Y

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

February 7—Council Meeting Boston.

Wednesday, March 7—Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker Dr Frank H. Lahey Boston. Subject to be announced. Film Electrocardiogram

Wednesday, April 4—Essex Sanatorium Middleton. Clinic 5 P.M. Dinner 7 P.M. Speakers Dr Elliott P Joslin and Dr Howard F Root, Boston. Subject Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting at Salem Hospital, 3 30 P.M.

Tuesday, May 8—Annual Meeting Salem Country Club, Forrest Street, Peabody Dinner at 7 Speaker to be announced. Subject to be announced.

RALPH E. STONE, M.D., Secretary

221 Cabot Street, Beverly Mass.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE M.D. Secretary

Sunderland, Mass.

HAMPDEN DISTRICT MEDICAL SOCIETY

January 30—See page 233

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place in March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D. Secretary

76 Church Street, Winchester Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meetings will be held on January 31, and April 25

T A. STAMAS M.D. Secretary

226 Central Street, Lowell, Mass

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

February 20—Meeting at the Metropolitan State Hospital, Waltham, 5 P.M.

NORFOLK DISTRICT MEDICAL SOCIETY

January 30—See page 233

February 27—Hotel Kenmore 8 30 P.M. Dr J H Shortell Industrial Medicine and Surgery

March 27—Faulkner Hospital, 8 30 P.M. Dr Henry H. Faxon and Dr Edward A. Edwards Symposium on Varicose Veins Discussion by Dr E E. O'Neil

April 17—Hotel Kenmore 8 30 P.M. Special Business Meeting

May—Annual Meeting Time place and program to be announced.

FRANK S. CRUICKSHANK, M.D. Secretary

1695 Beacon Street, Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

February 1—12 noon at Norfolk County Hospital. Stated Meeting Speaker Dr Sara Jordan. Subject Stomach Ulcers.

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker Dr Elliott P Joslin. Subject Diabetes

May 3—12 noon at Norfolk County Hospital. Annual Meeting Election of Officers.

N R. PILLSBURY M.D. Secretary

Norfolk County Hospital, South Braintree Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

January 31—See page 234

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals.

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program titles and speakers to be announced.

The Medical Profession is cordially invited to attend all of these meetings

JAMES H. MEANS M.D. Vice-President

GEORGE P. REYNOLDS M.D. Secretary

311 Beacon Street, Boston, Mass

ALEXANDER S. BEGG M.D.

Boston Medical Library

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester Mass

March 14—Dinner and scientific program at the Memorial Hospital, Worcester, Mass

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C. MILLER, M.D. Secretary

27 Elm Street, Worcester Mass.

BOOK REVIEWS

If I Have Children By G. FRANCIS SMITH. Published by Oxford University Press, London. 133 Pages Price \$1.75

This is a well written, brief treatise on the care of infants and children, designed for the use of mothers. It is not dissimilar to many other books on the subject. Although short, it contains much sound advice

Histopathology of the Peripheral and Central Nervous System By GEORGE B. HASSIN. Published by William Wood and Company, Baltimore. 491 Pages

This volume on the histopathology of the nervous system gives an accurate and comprehensive picture of the lesions encountered in various diseases of the nervous system. It is somewhat to be regretted that the author did not include gross descriptions of the pathological changes as well, to round out the excellent histopathologic presentation. The descriptions are straightforward and clear. An adequate bibliography is appended to each chapter. The illustrations are clear and well chosen. This volume presents a useful addition to our reference books on neuropathology

Food Nutrition and Health By E. V. McCOLLUM and J. E. BECKER. Published by authors. Baltimore 1933 146 Pages Price \$1.50

Another and revised edition of Dr McCollum's small book on nutrition is a welcome addition to the subject. In it the authors set forth in simple terms the nature of an adequate diet in relation to its use in daily life as the biochemist understands it. They also describe the dietary properties of common food-stuffs, point out the effects of malnutrition, and in the final chapter recommend principles of nutrition

GREATER BOSTON MEDICAL SOCIETY

TENTATIVE PROGRAM FOR POSTGRADUATE CLINIC DAY

Given by the Greater Boston Medical Society
At the Beth Israel Hospital, Boston
February 14, 1934

- 8-11 A M—Surgical Operations, Operating Floor
9 10 30—Surgical Ward Rounds, Floors 4B, 5D
9 12 — Clinical Demonstrations Medical Research
Division, Pathological Laboratory, Blood Labora-
tory, Special Clinics, Gastro-Intestinal, Nephrit-
ic, etc
10 30 12 — Medical Ward Rounds, Floors 4C, 5E
Surgical Dry Clinic, Auditorium.
12 30 1 30 P M—Luncheon at Hospital
1 45-4 30—Short clinical papers by members, audi-
torium

COMMITTEE ON ARRANGEMENTS

THE SOUTHEASTERN SURGICAL CONGRESS

The Southeastern Surgical Congress will hold its fifth annual assembly in Nashville, Tennessee, March 5, 6 and 7 The Andrew Jackson Hotel will be hotel headquarters and the lectures and exhibits will be in the War Memorial Building

The following doctors will occupy places on the program Fred H Albee, New York, W Wayne Babcock, Philadelphia, S O Black, Spartanburg, Wilray P Blair, St. Louis, Frank K Boland, Atlanta, J B Brown St Louis, D B Cobb, Goldsboro, N C George W Crile, Cleveland T C Davison, Atlanta John F Erdmann, New York, P G Flothow, Seattle, Seale Harris, Birmingham, M S Henderson, Rochester, Minn Arthur E Hertzler, Halstead, Kansas, Chevalier Jackson, Philadelphia, Walter C Jones, Miami, Dean Lewis, Baltimore, Joseph F McCarthy, New York, C Jeff Miller, New Orleans, A J Mooney, Statesboro, Ga, John J Moorhead, New York, Edward T Newell, Chattanooga, Fred Rankin, Lexington Ky Paul H Ringer, Asheville, Stewart Roberts, Atlanta, George H. Semken, New York, Phil C Schreier, Memphis, Arthur M Shipley, Baltimore, H E Simon, Birmingham, A. O Singleton, Galveston, J R. Young, Anderson, S C, Waitman F Zinn, Baltimore

For information, write Dr B T Beasley, 1019 Doctors Building, Atlanta.

SUFFOLK DISTRICT MEDICAL SOCIETY

The January meeting of the Suffolk District Medical Society will be held in conjunction with the Boston Medical Library and the Trudeau Society on Wednesday, January 31, 1934, at 8 15 P M, in John Ware Hall, 8 The Fenway

PROGRAM

"A Present View of Collapse Therapy in Pulmonary Tuberculosis" Willard B Soper, M D, Medical Director William Wirt Winchester Hospital, West Haven, Connecticut.

Illustrated by stereopticon.

Informal discussion from the floor will be invited
JAMES H. MEANS, M D, *Vice President*,
GEORGE P REYNOLDS, M D, *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, January 30, at 8 15 o'clock

PROGRAM

Presentation of Cases

"The Advantages to the Harvard School of Public Health of a Distinguished Ancestry" By Reginald Fitz, M.D

"The Beginnings of Microscopy at Harvard—The Hollis Gift of a Microscope (1732) Observations by Edward Bromfield Toward 1746" By Frederic T Lewis, M.D

JOHN HOMANS, M D, *Secretary*

FAULKNER HOSPITAL CLINICAL MEETING

The next monthly meeting will be held on Thursday afternoon, February 1, 1934 In addition to the usual pathological conference on the cases which come to autopsy during the month, Dr James R. Torbert will give a short talk on "The Treatment of Obstetrical Hemorrhage" All members of the profession are invited to attend

SOCIETY MEETINGS, CONGRESSES
AND CONFERENCESCOURSE ON MEDICAL BIBLIOGRAPHY
Boston Medical Library
1934

January 30—How to Go about the Investigation of a Medical Subject. Dr W C Quinby

February 6—The Making of Medical Books Dr Henry Viets

February 13—Incunabula James F Ballard
Tuesdays at 8 P.M.

Boston Medical Library 8 The Fenway

January 25—Massachusetts Central Health Council will meet at Whittier Health Unit at 4 00 P.M

January 29—New England Heart Association will meet in the Auditorium of the Beth Israel Hospital at 8 15 P.M

January 30—Harvard Medical Society See notice above
February 1—Faulkner Hospital Clinical Meeting See notice above

February 1—New England Hospital for Women and Children See page 233

February 7—Annual dinner of the Tufts College Medical School Alumni Association at the Boston City Club, 6 30 P.M.

February 12—House Officers Association of the Boston City Hospital. Subject 'Forensic Psychiatry' Speakers Dr A. Warren Stearns and Dr Abraham Myerson

February 14—New England Dermatological Society See page 233

February 14—Greater Boston Medical Society See notice elsewhere on this page

February 16 and 17—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club Boston. For details write Dr A. G. Engelbach Massachusetts General Hospital Boston

March 5, 6 and 7—The Southeastern Surgical Congress See notice elsewhere on this page

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E. R.

The New England Journal of Medicine

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NUMBER 5

TYPE I PNEUMOCOCCIC INFECTIONS WITH ESPECIAL REFERENCE TO SPECIFIC SERUM TREATMENT*

BY W D SUTLIFF, M.D.,† AND MAXWELL FINLAND, M.D.†

THE object of this paper is the brief presentation of data accumulated in three years' experience with the specific therapy of Type I lobar pneumonia with concentrated type-specific antibody prepared by the method of Felton. A number of reports of cases treated with such antibody appeared shortly after its development, all of which were similar in the favorable impression they conveyed^{1, 2, 3, 4}. It seems wise to examine the subsequent experience to judge whether the procedure is living up to its original promise.

Three aspects will be considered: (1) The relation which the number of cases of Type I pneumococcic lobar pneumonia seen early in the disease bears to the total number of cases of pneumonia and of pneumococcic infections which were encountered. This will give a fair indication of the frequency with which one may have occasion to use this therapeutic agent in actual practice. (2) The clinical characteristics of Type I pneumococcic infections, and particularly of pneumonia due to this organism. Early diagnosis, an important prerequisite in the choice of patients for serum treatment, depends, in turn, upon an acquaintance with such clinical characteristics. (3) The effects of serum therapy upon the clinical course and the death rate of Type I pneumococcic pneumonia.

PROPORTION OF PATIENTS SUITABLE FOR SERUM THERAPY

The relationship of Type I antipneumococcic serum therapy to the pneumonia problem as a whole may be roughly represented by the 1561 hospital cases summarized in table 1. This group represents all of the patients admitted to the Medical Services of the Boston City Hospital between September, 1929 and May, 1932 who were diagnosed or were suspected of hav-

ing pneumonia and from whom material was obtained for bacteriological study. It includes, in addition, a number of surgical cases in which pulmonary complications were suspected, and all other patients from whom pneumococci were obtained in the routine bacteriological laboratory. The material from all of these cases was studied especially for the presence of pneumococci of the various serological types. Only 151 of these patients with Type I pneumococcic

TABLE 1
PROPORTION OF PATIENTS SUITABLE FOR TYPE I
ANTIPNEUMOCOCCIC THERAPY

	Number of Cases
Patients bacteriologically investigated	1561
Patients harboring pneumococci of all types	1094
Patients with lobar pneumonia	770
Patients harboring Type I pneumococci	318
Adults with Type I lobar pneumonia	240
Adults with Type I lobar pneumonia admitted less than 96 hours after onset of the disease	151

lobar pneumonia were admitted to the hospital, less than 96 hours after the onset of their illness, and could thus be considered as suitable for serum therapy. These 151 cases represent, therefore, approximately one-tenth of the total number of cases investigated bacteriologically, about one-fifth of all the cases of lobar pneumonia and about three-fifths of the cases of Type I pneumococcic lobar pneumonia. In view of the lack of more direct data, it is justifiable to consider that these proportions probably hold in the community at large.

The nature of the cases from which Type I pneumococci were obtained but which are not included among the 239 adults with lobar pneumonia is given in table 2.

It will be noted in the table that in five patients, Type I pneumococci were recovered from the sputum but probably had no relation to the disease. These were patients with pulmonary tuberculosis or tuberculous pleurisy with effusion who were probably transient carriers of these organisms. This incidence of carriers, namely, five among 1561, or approximately 0.3 per cent, corresponds to the usual percentage of carriers of Type I pneumococci found in epidemiological investigations among the population at large.

*From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital and the Department of Medicine, Harvard Medical School.

This study was aided in part, by a grant from the William W. Wellington Fund of the Harvard Medical School and, in part, by a grant given in memory of Francis W. Peabody by the Ella Sachs Plotz Foundation.

The authors acknowledge gratefully the assistance of the following persons in carrying out this work: Drs. J. G. Kelley, J. M. Bethea, T. N. Hunnicutt, J. W. Parsons, J. J. Stanford, C. W. Steele and C. E. Welch and Mrs. Mary Truesdale, Miss Beatrice Tyndall and Miss Mary Carroll.

†Sutliff—Instructor in Medicine, University of Chicago, Finland—Assistant Physician, Thorndike Memorial Laboratory, Boston City Hospital. For records and addresses of authors see This Week's Issue, page 276.

to promote health Also in this section, foods to consume at meals in winter, spring, summer, and autumn are described, and abbreviated tables of the distribution of the vitamins and acid and alkaline foods enhance the value of the work. The book is valuable for the laity, dietitians, and students of nutrition

Opothérapie Endocrinienne By GUY LABOUEE Published by Masson et Cie, Paris Second Edition Price 48 fr

This book, dealing with endocrine therapy, is a valuable contribution to the field. The subject matter is arranged in orderly fashion. The first two chapters deal with a general survey of the field and discussion of endocrine products Then in order follow chapters on the thyroid, parathyroids, thymus, suprarenals, pituitary, testicles, ovaries, pancreas, and liver The last chapter deals with pluriglandular syndromes

The arrangement of each chapter is excellent. The physiology of the gland and the physiologic basis of therapy are discussed first, then follow discussions of the clinical syndromes of over and underfunction, and finally the indications and results of therapy The opinions, often somewhat fantastical, of continental writers are given freely In general, those statements representing the opinion of the author are conservative and cautious, and often the reasons for any given type of treatment are given at length.

A few minor errors, such as the wrong structural formulas for epinephrine and ephedrine, are of little consequence

The author concerns himself, for the most part, with the work and opinions of French and German authors To the American student, therefore, who is familiar with the work of Cushing, Evans, etc., and wants a survey of continental beliefs, the book is especially valuable

1933 Year Book of Radiology Diagnosis edited by Charles A. Waters, and Therapeutics edited by Ira I. Kaplan Published by The Year Book Publishers, Inc 804 Pages

The first Year Book of Radiology was received with many enthusiastic comments, but there was no assurance that a second edition would follow Indeed, it was feared that the cost of publication of such a book which is necessarily filled with expensive cuts and reproductions would discourage further editions

This second edition, however, is at hand and shows no evidence of either reduction in cost or quality The section on diagnosis edited by Dr Charles A. Waters of Johns Hopkins University has gained one hundred pages in volume and the editor has intentionally selected those articles which are most adequately illustrated Since this admirable

work is prepared primarily for those who are not in contact with the large libraries and those who are not so fortunate as to view a large number of radiographs each year, it is quite necessary that the abstracted article be accompanied by clear and adequate illustrations Many articles have been omitted which are of considerable value probably because of poor illustration and lack of space The index is so constructed that one may readily refer to any subject or author included in the book

The section on Radiotherapeutics edited by Dr Ira I. Kaplan has increased about fifty pages in volume over that of last year Abstracts are included which deal with nearly every form of radiation therapy, and one might conceivably use these sections of the two Year Books as textbooks on x-ray and radium therapy

Surgery of the Stomach and Duodenum By J. SHELTON HORSLEY, M.D., F.A.C.S., LL.D. Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. With 136 illustrations Published by The C. V. Mosby Company, 1933 Price \$7.50

Any publication by Dr. Horsley is worthy of serious consideration because of his reputation as a surgeon This book is so thorough, and is presented in such clear English, that it could not fail to add to the knowledge of a medical student or an expert surgeon

The developmental embryology and anatomy are clearly described Diseases of the stomach and duodenum are written up from a surgical aspect. The preoperative treatment of these diseases is helpfully discussed Several case histories are extremely interesting The pictures give such a clear idea of surgical procedure that in some cases one is tempted to neglect the text.

Every once in a while in the book, one runs across statements which especially lead to thought and discussion, as on page 87, Why are so many opportunities for the care of gastric cancer missed? Also, on page 239, where an original method (at least to the writer) of catching duodenal secretions is depicted.

This book is worth keeping in one's library after reading

International Clinics Edited by Louis Hamman Forty-Third Series 1933 Published by J. B. Lippincott Company, Philadelphia. 316 Pages

This volume opens with a symposium on diseases of the parathyroid glands by a group of well known authors The subject is well summarized as is agranulocytic angina, infectious mononucleosis, pellagra and others too numerous to mention Certainly this volume is a reflection of current medical subjects of absorbing interest and can be highly recommended. The section on surgery is abbreviated and of minor importance

similar to the incidence reported by other writers⁸

SPECIFIC THERAPY

Selection of patients In general, all adult patients in whom pneumococci of Type I were recognized within 96 hours of the onset of acute lobar pneumonia were sought for specific treatment. Due to the treatment of cases on some of

TABLE 4

PUPULENT COMPLICATIONS OF TYPE I LOBAR PNEUMONIA
IN 239 ADULTS

	Number	Per Cent
Empyema	30	12.6
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Abscess of Parotid	1	0.4
Abscess of Submaxillary	1	0.4
Abscess of Buttocks	1	0.4
Abscess of Arm	1	0.4
Abscess of Pelvis	1	0.4
Phlebitis	1	0.4
Total	43	18.1

the Medical Services by other methods or due to delay in diagnosis only 75 of 151 cases admitted before the fifth day received serum. A few patients other than those described were given specific therapy during certain periods for purposes of investigation. Except for a brief period the results of which have been reported⁹ no formally selected controls are available. The results of therapy in the treated cases and especially in the 75 cases entering the hospital before the end of the first 96 hours of the disease may be compared however with the eventual outcome in untreated patients seen at the same period of their disease and during the same seasons. They may also be compared with control patients formally selected by others.^{1, 2, 3, 4}

Methods The pneumococcic type was determined within from three to 12 hours in the great majority of cases, by means of the stained slide agglutination test (Sabin¹⁰). Upon finding a Type I pneumococcus serum therapy was begun at once. The patient was questioned carefully for allergic history in general, and for previous administration and hypersensitiveness to horse protein in particular. A skin test and an ophthalmic test were done with the therapeutic serum. The latter was done to detect, if possible, the dangerous type of horse protein sensitiveness. The dosage used routinely was 5 cc, 25 cc and 45 cc at two-hour intervals. All of the serum was given intravenously. * More serum was given at intervals of eight to 12 hours after the third dose if it seemed indicated by the clinical condition. In a small number of cases the details of the procedure varied as a part of other studies.^{9, 11}

Duration of the Acute Disease The duration of the acute disease was measured from onset to the time when the temperature dropped and stayed below 101°F and the other symptoms of the acute disease subsided. The duration of acute symptoms in all the specifically treated patients who entered the hospital less than 96 hours after the onset of their illness and recovered without complications are shown in chart 1. Within 48 hours after admission to

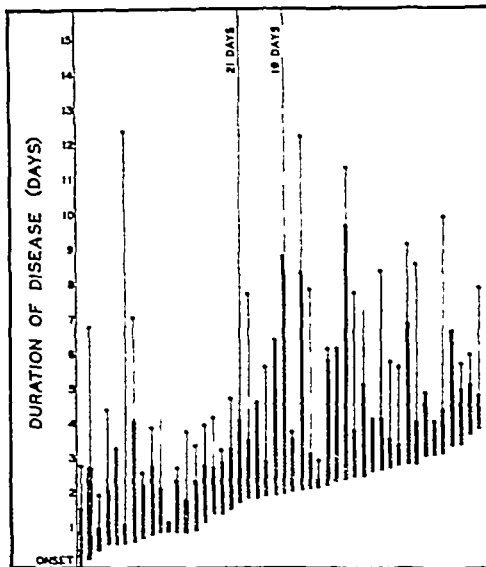


CHART 1 Duration of the disease in 46 serum treated cases. Each bar represents one patient. The distance of the bar from the base-line represents the duration of the disease before entry the hatched portion, the time from admission to the time of serum administration the solid portion, the time to the first permanent drop in temperature below 101°F and the light line, the time until all symptoms disappeared. Only cases admitted less than 96 hours after onset in which recovery occurred without febrile complications are shown.

the hospital 37, or 80 per cent, of the 46 specifically treated patients had already had a sharp drop in temperature. In chart 2, all of the

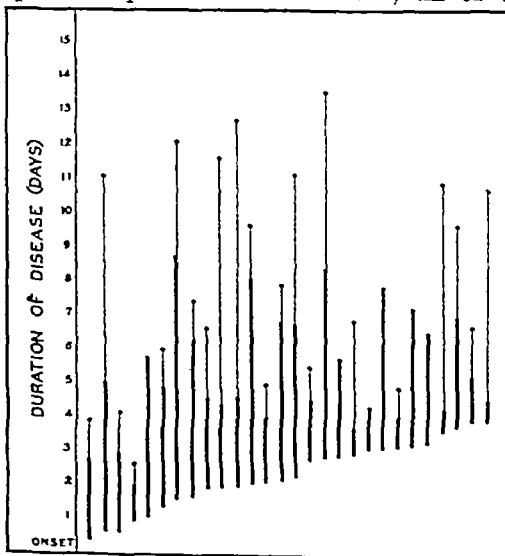


CHART 2 Duration of the disease in 28 cases that received no serum. Similar to chart 1 except that the solid portion here represents the time from admission to the hospital to the first persistent drop in temperature below 101°F associated with marked symptomatic improvement.

Concentrated serum was supplied by the Antitoxin and Vaccine Laboratory of the Massachusetts Department of Public Health. The potency varied from 2000 to 4000 units (Felton) of Type I antibody per cubic centimeter.

CLINICAL CHARACTERISTICS OF TYPE I PNEUMONIA

Character of the pulmonary lesion Pneumonia produced by Type I pneumococci, like that due to Type II pneumococci and unlike that of other pneumococcic types⁵ is nearly always of the typical lobar variety. In only five of the 273 cases of pneumonia was the pathological process that of patchy consolidation or bronchopneumonia. Two of these five patients were, respectively, 50 and 62 years of

frequent symptoms were (1) sudden onset, (2) chill, (3) pleuritic pain and (4) bloody sputum. These occurred, respectively, in 94, 79, 79 and 75 per cent of all cases in which reliable data were available. Sixty per cent of the 131 recovered cases terminated by crisis. A history of acute upper respiratory tract infection preceding the onset of the pneumonia was obtained in 59 per cent of the patients, showing that this

TABLE 2

PATIENTS HARBORING TYPE I PNEUMOCOCCI OTHER THAN ADULTS WITH LOBAR PNEUMONIA

	Number of Cases
Less than 12 years of age	
Lobar Pneumonias and Empyemas	50
Bronchopneumonia	
(3 infants, 2 aged adults)	5
Adults with empyema	10
Pneumococcic infections in adults other than in lungs and pleura	8
Otitis media—1	
Meningitis—1	
Osteomyelitis—1	
Infected hemothorax—1	
Infected abortion—2	
Chronic salpingitis—1	
Peritonitis—1	
No apparent pneumococcic infection	5
	78

age, and the other three were infants. The patchy nature of the consolidation was confirmed at postmortem in all. These five cases are worthy of special note because it has been thought that the Type I pneumococcus did not produce bronchopneumonia. It is of considerable interest in view of the age variations in blood immune bodies and mortality rates that these atypical cases appear exclusively at the extremes of life⁶.

Primary and secondary pneumonia Lobar pneumonia was the primary disease in 225 or 96 per cent of the 239 cases. Bronchopneumonia, on the contrary, was secondary to other conditions in all but one of the five cases. A list of the primary diseases, where pneumonia was secondary, is given in table 3. Lobar pneumonia, in a number of instances, was secondary to operations on the nose or throat suggesting that a direct infection took place. In these cases there was a sudden onset within a few hours after either the operative procedure or the normal delivery. The preponderance of secondary pneumonia among the cases with bronchial consolidation has been noted in infections due to other pneumococcic strains⁵.

Symptomatology Symptoms characteristic of clinical lobar pneumonia were noted with the frequency to be expected, indicating that they are a valuable guide in selecting patients for bacteriological study and treatment. The most

TABLE 3

PRIMARY DISEASES IN SECONDARY PNEUMONIA

	Number of Cases
LOBAR PNEUMONIA	
Staphylococcic pyemia	1
<i>Total acute infections</i>	1
Incision of peritonsillar abscess	1
Extraction of teeth	2
Tonsillectomy and adenoidectomy	1
Paracentesis of otitis media	1
Normal deliveries	3
<i>Total operative procedures and normal deliveries</i>	8
Cardiac decompensation	2
Arteriosclerotic heart disease and uremia	1
Senility, arteriosclerosis chronic nephritis	1
Chronic nephritis and uremia	1
<i>Total systemic diseases</i>	5
TOTAL SECONDARY LOBAR PNEUMONIAS	14
BRONCHOPNEUMONIA	
Pertussis	2
<i>Total acute infections</i>	2
Subarachnoid hemorrhage	1
Carcinoma of stomach and marantic endocarditis	1
<i>Total systemic diseases</i>	2
TOTAL SECONDARY BRONCHOPNEUMONIAS	4

history is of little value in distinguishing Type I lobar pneumonia from pneumonias due to other types.

Age and sex The distribution of cases according to age and sex was similar to that observed by other physicians^{7, 8}. The distribution by age indicated a relative preponderance of Type I pneumonia in the decades from 20 to 40 years. The male sex predominated, accounting for 75 per cent of the cases.

Complications Febrile complications occurred in a relatively higher number of cases than in other pneumococcic types with the exception of Type V⁵. Thirty empyemata were seen among 239 lobar pneumonias, 12.6 per cent, and other purulent complications were seen in 13 of 239 cases or 5.5 per cent, making a total of 18.1 per cent. (See table 4.) This is very

similar to the incidence reported by other writers⁸

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Duration of the Acute Disease The duration of the acute disease was measured from onset to the time when the temperature dropped and stayed below 101°F, and the other symptoms of the acute disease subsided. The duration of acute symptoms in all the specifically treated patients who entered the hospital less than 96 hours after the onset of their illness and recovered without complications are shown in chart 1. Within 48 hours after admission to

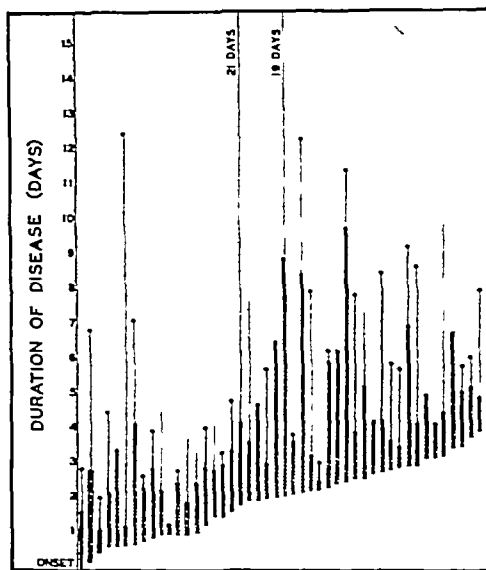


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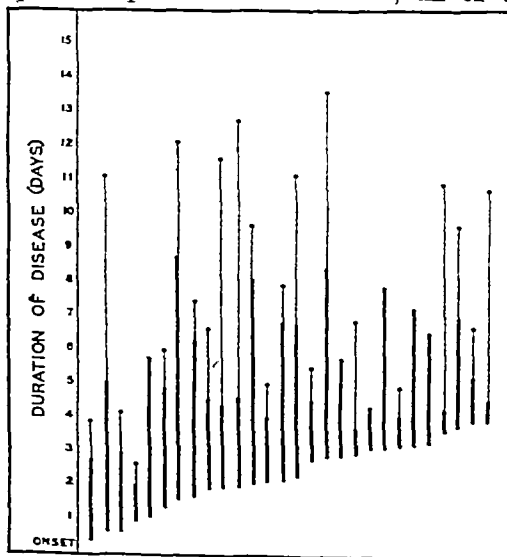


CHART 2 Duration of the disease in 28 cases that received no serum. Similar to chart 1 except that the solid portion here represents the time from admission to the hospital to the first persistent drop in temperature below 101°F associated with marked symptomatic improvement.

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similar cases that did not receive specific therapy are represented in the same way. A similar sharp drop in temperature occurred with general improvement in seven, or 25 per cent, of the 28 patients who did not receive specific therapy. When the treated patients are grouped, not according to the time of their admission to the hospital, but according to the time at which they actually received serum, it is found that 30, or 82 per cent, of 38 patients treated before the end of 96 hours after the onset of their disease had a sharp and persistent drop in temperature to below 101°F within 36 hours after serum treatment was begun.

The average duration of the disease in comparable treated and untreated patients is illustrated at A and B in chart 3. The average de-

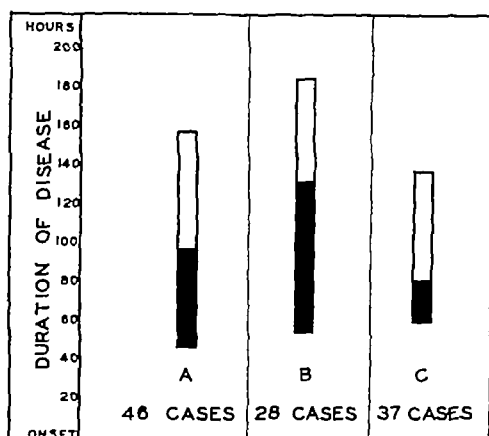


CHART 3. Average duration of disease in serum treated and non-serum treated patients. A. represents the average duration in 46 serum treated patients admitted to the hospital within 96 hours of the onset already shown individually in chart 1. B. represents the average duration in 28 non serum treated patients admitted to the hospital within 96 hours of the onset, already shown individually in chart 2.

A. and B. represent the average duration of comparable groups. The distance from the beginning of the bars to the base line represents the average duration in each group at the time of admission; the length of the solid portion represents the average time from admission to the first persistent drop in temperature below 101°F associated with marked symptomatic improvement. The rest of the bar represents the average time during which minor symptoms and low grade fever persisted.

C. represents the average duration of the disease after serum therapy in 37 patients in whom treatment was begun within 96 hours after the onset of the disease. This is similar to A. and B. except that the distance of the bar from the base line represents the average duration at the time serum treatment was begun and the solid portion represents the average duration of fever above 101°F and acute symptoms after such treatment.

crease in duration of the disease accounted for by serum therapy was about 30 hours. The close association of serum administration with marked symptomatic improvement is shown at C in chart 3 where an average of but 12 hours intervenes between the administration of the first dose of serum and striking symptomatic improvement. This shorter average duration among serum-treated patients is accounted for almost entirely by the earlier occurrence of a marked drop in temperature. The average duration of low-grade fever and symptoms occurring subsequent to a marked improvement, is about the same in all three groups, and varies between 57 and 60 hours. The administration

of specific therapy apparently hastens the occurrence of the marked symptomatic change, but has no effect upon the continued low-grade fever and lesser complaints. No difference appeared between the type of recovery in serum treated patients and patients not specifically treated. Crisis, defined as the fall of temperature from near the height of its rise to below 101°F within 24 hours with accompanying symptomatic improvement and without relapse, occurred just as often in the specifically treated as in those not specifically treated, in 30 of 46 cases of the former, or 65 per cent, and in 18 of 25 cases of the latter, or 64 per cent, of those recovered without complications.

Course of Bacteremia. More than one blood culture was made in 65 of the specifically treated cases, and in 39 of those not specifically treated. The changes that took place in the blood cultures are shown in table 5. The effect

TABLE 5
EFFECT OF SPECIFIC SERUM THERAPY ON BACTEREMIA

	Specifically Treated	Not Specifically Treated
Bacteremia on Admission—		
Number	30	17
Bacteremia Disappeared—		
Number	26	7
Bacteremia Disappeared—		
Per Cent	86.6	41.1
No Bacteremia on Admission—		
Number	35	22
Bacteremia Developed—		
Number	1	5
Bacteremia Developed—		
Per Cent	2.8	22.7

of specific therapy was striking in that, with four exceptions, bacteria disappeared from the blood in cases with bacteremia and, with one exception, no blood invasion occurred in patients with originally sterile cultures. Comparison of the specifically treated group with the patients not specifically treated shows that bacteremia disappeared in 87 per cent of the former as compared with 41 per cent of the latter, or more than twice as often, and that bacteremia developed in three per cent of the former as compared with 23 per cent of the latter, or one-eighth as often. The four specifically treated patients, whose bacteremia persisted, were unusual in other respects. In one, a heavy bacteremia was present, 674 colonies per cc of blood, which decreased but did not completely disappear. In two, a double infection was found, Types I and X in one, and Types I and III in the other. The first of these two patients was insufficiently treated, receiving only 30 cc of serum shortly before exitus, and, in the second, the Type I pneumococcus was completely replaced by a very heavy infection with pneu

mococcus Type III, 2700 colonies per cc of blood. The fourth and last of the treated patients with persistent blood cultures continued to have a bacteremia along with an empyema. Likewise, the single patient, who developed a bacteremia after serum therapy, developed it following the appearance of empyema.

The Course of the Consolidated Area The

in such poor condition that they could give no history. A second and more fair comparison between the treated and the untreated patients is, therefore, given in table 6 for which the specifically treated patients admitted before the end of 96 hours of the disease and a similar group of the untreated patients were chosen. The death rate of the specifically treated pa-

TABLE 6
DEATH RATE AND DURATION OF THE DISEASE

	Specifically Treated			Not Specifically Treated		
	No	No Died	Per Cent Died	No	No Died	Per Cent Died
All patients	97	18	18.6	143	59	41.3
All patients admitted to the hospital less than 96 hours after the onset	75	12	16.1	76	28	36.8
Treatment begun less than 96 hours after onset	58	7	12.0			
Treatment begun more than 96 hours after onset	39	11	28.2			

TABLE 7
DEATH RATE AND AGE

(Includes Only Cases Admitted Less Than 96 Hours After Onset of Pneumonia)

Age Groups	Specifically Treated			Not Specifically Treated		
	No of Cases	No Died	Per Cent Died	No of Cases	No Died	Per Cent Died
12-29 years	27	0	0	22	8	36.4
30-49 years	33	7	21.2	28	6	21.4
50+ years	14	5	35.6	11	8	73.0

TABLE 8
BACTEREMIA AND DEATH RATE

	Specifically Treated			Not Specifically Treated		
	No of Cases	No Died	Per Cent Died	No of Cases	No Died	Per Cent Died
First blood culture positive	38	10	26.3	42	30	71.4
First blood culture negative	49	8	16.3	54	9	16.6
No blood culture made	10	0	0	47	20	42.5

spreading of the area of consolidation was observed in only three treated patients and in 14 of the untreated patients. The extension of the lung lesion is apparently hindered by specific therapy.

The Death Rate Although small groups of pneumonia patients, reported on many occasions, have varied in their mortality rates, large groups have been surprisingly uniform. The present series shows results which are similar to those of other series of comparable size.

In table 6, the death rate for all the patients is shown, and the rates for those specifically treated and for those not specifically treated. Such a comparison is obviously unfair because the untreated patients include a rather large number of patients who were admitted to the hospital late in the course of their disease only to die shortly afterwards, or who were admitted

patients is less than half that of the patients that received no specific therapy. This comparison, in turn, does not represent the best effects of early therapy, since patients are included on the basis of their time of entrance to the hospital without allowance for delays and variations in the institution of specific therapy. The death rate of patients in whom serum administration was begun before the end of 96 hours of the disease is, therefore, also shown, and for comparison the death rate in patients in whom serum administration was begun after the end of 96 hours of disease. The use of specific serum therapy before the end of 96 hours after the onset reduced the death rate to 12 per cent. This compares favorably with the figures reported by Cole¹², Cecil and Plummer⁴, Finland³, and Heffron and Anderson¹³.

Death Rate and Age of Patients One of the

TABLE 9
PROGNOSTIC FACTORS AMONG SPECIFICALLY TREATED CASES ENDING FATAALLY
(Includes Only Cases Admitted Less Than 96 Hours After Onset of the Disease)

Year	Case Number	Age	Duration in Hours		Amount of Serum	Alcoholism	Blood Culture Before Treatment	Systemic Complications	Postmortem			
			To Ad mls	After mls	cc							
29-30	1	44	In Hosp	50	46	4	30	++++	Neg	0	0	
	5	74	55	87	130	12	74	0	1000 Col	Arteriosclerosis, Aur Fib	0	
	14	76	81	51	111	21	100	0	Neg	Arteriosclerosis, Aur Fib	0	
	*30	50	11	76	22	65	115	+	Neg	Hem Strep in sputum	0	
30-31	4	39	45	25	60	10	119	++	Pos	Pn III in sputum	0	
	6	30	In Hosp	106	71	35	135	0	24 Col	Miscarriage	Organizing Pneumonia	0
	21	34	36	72	77	31	108	0	674 Col		Fatty Liver	0
	29	66	56	61	113	4	30	0	11 Col per cc	Septicemia, Pn X		0
31-32	32	33	78	173	136	115	276	++	Pos			
	5	45	64	172	211	21	117	0	Pos			
	10	74	28	208	41	195	55	0	Pos	Senile	Lobar Pneumonia	
	24	30	23	456	45	434	55	+	Pos	Septicemia, Hem Strep	General Arteriosclerosis Staph Aur, Strep Hem	

*Underlined cases had relatively good prognosis

TABLE 10

PROGNOSTIC FACTORS AMONG PATIENTS NOT SPECIFICALLY TREATED ENDING FATALLY
(Includes Only Cases Admitted Less Than 96 Hours After Onset of Disease)

Year	Case No	Age	Duration in Hours To After Adm Adm		Alcoholism	First Blood Culture	Systemic Complications	Postmortem
1929-30	2	68	28	163	0	Positive	0	Lobar Pneumonia
	*5	53	47	130	0	Negative	0	0
	9	62	19	179	+	Negative (+ later)	0	0
	18	60	83	22	0	200 Col per cc	Pyelonephritis	Lobar Pneumonia
	19	62	24	48	++	Negative (+ later)	0	0
	25	70	4	111	0	70 Col per cc.	0	0
	27	20	52	76	0	Negative	0	0
	35	51	3	321	0	Negative	Arteriosclerosis Aur Fib	Empyema
	36	21	63	135	0	Positive	0	Lobar Pneumonia
	74	59	85	97	0	Negative	0	0
	43	45	21	216	0		0	Empyema
	62	19	93	31 days	0	Negative	Empyema	
1930-31	5	29	21	215	0	Negative (+ later)	0	Pericarditis Card Infarct
	6	58	74	109	0	Negative	Arteriosclerotic Heart Disease, Uremia	0
	27	24	22	100	0	250 Col per cc.	0	0
	31	71	48	45	0	—	Arteriosclerotic Heart Disease	Bronchiectasis
	32	75	In Hosp	187	0			Chronic Nephritis Gen Arteriosclerosis
	33	61	39	17	0			Lobar Pneumonia
	34	27	80	115	0	Positive	0	0
	39	40	56	161	+	Positive	0	0
	46	52	48	48	0	Positive	0	0
1931-32	4	64	36	88	0		0	0
	1	37	46	65	+	9 Col per cc.	0	Lobar Pneumonia
	5	46	33	195	++++	Positive	0	0
	20	35	48	118	+++	Negative	0	Lobar Pneumonia
	28	41	72	131	0	Positive	0	0
	29	25	53	208	0	Negative (+ later)		Lobar Pneumonia
	40	21	60	99	0	Negative	0	0

*Underlined cases had relatively good prognosis

most important and constant of the factors affecting the prognosis in lobar pneumonia is age. Table 7 shows the death rates in three different age groups in comparable groups of cases with and without specific therapy. In the age group 12 to 29 years, no treated patient died. Reduction of the death rate in Type I pneumonia at all ages, over 12, has been reported by others¹. These figures indicate that old age and youth are both benefited by its use.

Death Rate in Bacteremic Patients. The marked effect of serum therapy upon bacteremia leads one to expect a corresponding effect upon the death rate in bacteremic cases. Table 8 shows that the most pronounced effect of serum therapy was in the group of patients who had positive blood cultures.

Description of Cases with Fatal Outcome. A study of the deaths among the serum treated cases admitted within 96 hours of onset of the disease (table 9) brings out certain conditions that may be responsible for the failure of serum treatment. Ten of the 12 serum treated patients who died had unusually bad prognoses due to age (60 years and over), systemic diseases, marked alcoholism, more than one strain of organism in the blood stream, marked bacteremia, insufficient amounts of serum or treatment very late in the disease. Similar complicating factors, indicating a bad prognosis, were found in 16 of 28 comparable fatal cases not receiving specific treatment (Table 10). It is thus possible to point out a greater proportion of cases with bad prognoses among the specifically treated cases ending fatally. There was no apparent reason for death, other than lobar pneumonia, in only two serum treated cases as compared with 12 comparable non-serum treated cases.

DISCUSSION

When seeking to evaluate the importance of specific Type I antipneumococcic therapy, its relationship to pneumonia, as a whole, needs consideration. By reason of its type specificity and need for early application, it is useful in only one of ten patients that may be suspected at some time in their illness of having pneumococcic pneumonia, and in only one of every five patients who are known to have pneumococcic lobar pneumonia. The number of cases of lobar pneumonia reported per year in Massachusetts is from 4,080 to 5,544¹⁴, making about one case per year for each of 6595 practicing physicians. This places Type I pneumonia cases seen early in a class with infrequent or rare diseases. Within this limitation, Type I antipneumococcic serum therapy is of the greatest usefulness. It is, at present, the only well-demonstrated therapeutic measure to add to the usual symptomatic treatment of pneumonia. Vaccine therapy has not been studied with such

thoroughness and is not supported by convincing animal experimentation. The use in man of the type-specific enzymes of Avery and Dubos¹⁵ has not as yet been reported. In the present state of our knowledge, specific serum therapy gives greater promise of extending specific therapy to pneumonia, as a whole, than any other proposed therapeutic measure, as has been indicated through its successful use in Type II pneumonia^{16, 17}, and the suggestive effects obtained in other rarer types¹⁸.

The problems remaining in regard to this therapeutic agent concern almost entirely its practical applications. These have been considered and, to a large extent, solved, as evidenced by the favorable results reported in the literature and referred to above. The essentials of its administration are commonplaces of medicine, and may readily be applied as the value of specific serum is appreciated. They may be enumerated as (1) alertness in diagnosis, so that cases may be recognized as early as possible¹⁹, (2) bacteriological examination of the sputum^{20, 21}, (3) a knowledge of the safe administration of intravenous therapy²².

One difficulty has been discussed rather widely, namely, the high cost of potent serum. This financial matter is gradually being met. Improvements in manufacture and distribution and increased use are bringing about a decrease in cost. This therapy, however, is so valuable that the costs, whatever they are, must be met by appropriate authorities.

SUMMARY AND CONCLUSIONS

The foregoing data, and similar results obtained by other observers, leave no room to doubt that concentrated Type I antipneumococcic serum exerts a striking symptomatic effect and reduces the death rate by one-half in Type I lobar pneumonia in adults. Repeated studies have also shown that the effects are type specific¹¹, that treatment early in the course of the disease is more effective than later, that treatment is equally effective at all ages, and that bacteremia, as a symptom, and bacteremic cases, as a group, are especially amenable to specific therapy. The results that may be expected in patients treated before the end of 96 hours of illness may be briefly summarized as a marked symptomatic change in two thirds of the recovered patients within 36 hours of beginning treatment, and a death rate approximating ten per cent.

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THE CERVICAL CESAREAN SECTION*

An Analysis Based on the Study of Five Hundred and Fifteen Personal Operations

BY LOUIS E PHANEUF, M D †

IN 1907, Frank, of Cologne, having become dissatisfied with the results of the classical cesarean section, especially in women who had been long in labor and were presumably infected, proposed effecting abdominal delivery through the lower uterine segment. The method soon found adherents in Germany but was not enthusiastically received elsewhere. Only within the last fifteen years has it been given careful consideration in the United States. At the present time it is slowly but gradually replacing the conservative or classical cesarean section. During the last twenty-five years the procedure has been modified in numerous small details and the names of various operators have become attached to it. I have endeavored to consider these modifications upon an anatomical basis.

Anatomically the lower uterine segment may be approached by one of three methods in performing cesarean section—1, *Extraperitoneally*, the operation most used nowadays being the modification of Latzko. 2, *Transperitoneally*, peritoneal exclusion—represented by the procedure of Veit-Fromme-Hirst, where the layers of parietal and visceral peritoneum are united by sutures, thus creating a so called extraperitoneal space. 3, *Intraperitoneally*, where the abdomen is opened by a longitudinal median suprapubic incision and the bladder separated from the lower uterine segment which is incised either longitudinally or transversely to accomplish delivery. Following the closure of the incision the bladder is sutured back on the uterus in such a way that the incision becomes retrovesical, retroperitoneal or subperitoneal. The

cervical incision thus becomes isolated from the general peritoneal cavity.

The extraperitoneal operation is usually performed on the frankly infected woman whose labor has been mismanaged. My personal feeling in this regard is that when a parturient patient has reached this stage of neglect and needs an abdominal delivery her life is better protected by the supravaginal amputation of the uterus or Porro cesarean section. It is an established fact that a virulent organism the streptococcus for instance, may find its way through the intact peritoneum after the extraperitoneal cesarean and cause general peritonitis. My only death from peritonitis in a series of 515 consecutive cervical cesarean sections occurred in a woman delivered by the extraperitoneal route, while in a series of seven badly mismanaged labors, terminated by the Porro method, all the parturients recovered. These severely infected patients as a rule form but a small group in the large series of cases. The transperitoneal operation—peritoneal exclusion—is reserved for women who have been long in labor, whose membranes have been ruptured for many hours and who have been subjected to vaginal examinations. Although no clinical signs of infection may be present, in the light of our present knowledge, they are considered as presumably infected. The intraperitoneal operation, which I prefer to perform, with a transverse incision in the lower segment, is used on the average patient and may be safely executed after an adequate test of labor under aseptic conditions. This last method has been substituted for the classical cesarean section in my practice for a number of years.

I have personally performed 515 cervical

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cesarean sections using the four types of operations according to table I

TABLE I
TYPE OF OPERATION

Total number of cervical cesarean sections	515
Extraperitoneal (Latzko)	2
Transperitoneal (Peritoneal Exclusion) Veit Fromme-Hirst	61
Intraperitoneal (Longitudinal cervical incision Krönig)	160
(Transverse cervical incision)	292

In analyzing these 515 cervical cesarean sections, tables are used for the sake of clearness and the anatomical classification described above is adhered to

TABLE II
NUMBER OF PREGNANCIES

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Para I	1	44	63	120
Para II		11	45	78
Para III			27	52
Para IV		3	13	19
Para V		1	7	11
Para VI		1	1	4
Para VII		1	2	
Para VIII			1	2
Para IX			1	2
Para X	1			3
Para XI				1
Total	2	61	160	292

TABLE III
LABOR

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Test of labor	2	43	44	95
No labor	0	18	116	197
Total	2	61	160	292

EXTRAPERITONEAL

Two patients had labor. In one the hours were not determined, the cervix was fully dilated. The second was in labor thirty-six hours.

TRANSPERITONEAL

The 43 patients who had labor had the following number of hours: 72 hours, one patient, 67 hours, one patient, 48 hours, one patient, 36 hours, two patients, 35 hours, one patient, 34

hours, one patient, 25½ hours, one patient, 24 hours, eight patients, 23 hours, one patient, 20 hours, one patient, 18 hours, one patient, 17 hours, one patient, 16 hours, two patients, 14 hours, two patients, 12 hours, two patients, 6 hours, one patient, 5 hours, one patient, 4 hours, one patient. In the other 14 patients who had labor the number of hours was not noted.

INTRAPERITONEAL

Longitudinal Incision

The 44 patients who had labor had the following number of hours: 72 hours, one patient, 36 hours, one patient, 26 hours, one patient, 24 hours, five patients, 17 hours, one patient, 16 hours, one patient, 12 hours, six patients, 10 hours, one patient, 8 hours, one patient, 6 hours, two patients, 3 hours, one patient. In the other 23 patients who had labor the number of hours was not determined.

Transverse Incision

The 95 patients who had labor had the following number of hours: 72 hours, two patients, 64 hours, one patient, 48 hours, two patients, 36 hours, one patient, 30 hours, two patients, 29½ hours, one patient, 27 hours, one patient, 26 hours, two patients, 24 hours, four patients, 21 hours, one patient, 20½ hours, one patient, 20 hours, four patients, 19½ hours, one patient, 19 hours, one patient, 17 hours, two patients, 16 hours, four patients, 15½ hours, one patient, 15 hours, four patients, 14½ hours, one patient, 14 hours, four patients, 13 hours, two patients, 12½ hours, two patients, 12 hours, eight patients, 11 hours, two patients, 10 hours, two patients, 9 hours, two patients, 8 hours, eight patients, 7½ hours, one patient, 7 hours, three patients, 6 hours, six patients, 5 hours, two patients, 4 hours, three patients, 3 hours, two patients, 2¾ hours, one patient, a few hours, three patients. In the other 8 patients who had labor the number of hours was not determined.

TABLE IV
MEMBRANES

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Membranes ruptured	1	8	11	34
Membranes intact	1	53	149	258
Total	2	61	160	292

EXTRAPERITONEAL

In one woman the membranes had been ruptured many hours, in the other they were intact.

TRANSPERITONEAL

In one woman the membranes had been ruptured 24 hours. The other seven women had long labors and the membranes had been ruptured many hours.

INTRAPERITONEAL

Longitudinal Incision

The membranes were ruptured 10 hours in one, 6 hours in another and the number of hours in 9 not determined.

Transverse Incision

The membranes in 34 patients had been ruptured the following number of hours: 72 hours, one patient, 48 hours, three patients, 30½ hours, one patient, 30 hours, one patient, 26 hours, one patient, 24 hours, two patients, 21 hours, one patient, 19 hours, one patient, 18 hours, one patient, 17 hours, one patient, 15 hours, one patient, 14 hours, one patient, 12 hours, two patients, 8 hours, two patients, 7 hours, two patients, 3 hours, one patient, 2¾ hours, one patient. In 11 patients the hours were not determined.

TABLE V
CERVICAL DILATATION

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Cervix fully dilated	2	7	3	9
Cervix half dilated		8		3
Cervix one-third dilated				1
Cervix one-quarter dilated		9		
Cervix dilated to admit				
4 fingers				1
3 fingers			1	3
2 fingers		1	6	2
1 finger			5	
Cervix slightly dilated		15		
Dilatation not determined			29	76
Total	2	40	44	95

In the 181 patients who had labor the amount of cervical dilatation is expressed in Table V. In the 334 who had no labor the cervix was dilated from above at the time of operation, to favor drainage.

There were 28 vaginal examinations, 27 performed outside and 1 in the hospital.

One parturient had a sixty-four hour labor followed by a trial high forceps. Since it was

impossible to bring down the head with moderate traction she was delivered by a transverse cervical cesarean section, the placenta and membranes being delivered through the vagina. She had an afebrile puerperium and no post-operative complications.

All labors in my practice are conducted by rectal examinations, hence the small number of vaginal examinations.

In a number of instances there were two or more indications. When this condition obtained the most important indication was listed.

TABLE VI
VAGINAL EXAMINATIONS

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Several vaginal examinations	2	5	4	
Three vaginal examinations				1
Two vaginal examinations		5	1	1
One vaginal examination		1	3	5

For local anesthesia a one per cent solution of novocaine was used.

For spinal anesthesia novocaine crystals dissolved in spinal fluid were employed. The dosage has been 100, 120 and 150 mg. the last dose being rarely used and only in large women.

Avertin, 0.080-0.090 mg. per kilo was used as basal anesthesia and followed by nitrous oxide oxygen anesthesia.

In the study of maternal mortality certain conditions have to be given consideration. No just comparison can be made of a series of operations carried out in a well-equipped maternity center where all the facilities are available, where there has been no contamination during labor and where an operating room is set aside for cesarean sections with another series of operations many of which were performed in small town hospitals where but one operating room exists for septic as well as clean cases, where the patient has been in labor many hours and where frequently she has been subjected to vaginal examinations. Even while operating under these adverse conditions, for women requiring cesarean section are frequently seen in consultation in their own communities, the cervical cesarean section has been responsible for saving the lives of many parturients who otherwise might have been doomed. Again, the mortality will be influenced by the condition for which the cesarean is done. For example, the result of an operation performed for disproportion between the pelvis and the presenting part

TABLE VII

INDICATIONS

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Cephalopelvic disproportion	2	38	69	95
Cephalopelvic disproportion and myoma		1		1
Spondylolisthetic pelvis		1		
Nagele pelvis			1	1
High breech, generally contracted pelvis		2	4	10
Transverse presentation		1		1
Dystrophia dystocia syndrome				1
Previous classical cesarean section		4	10	17
Previous cervical cesarean section			36	92
Previous classical and cervical cesarean sections			1	
Eclampsia		3	2	
Toxemia of pregnancy			8	13
Soft part dystocia from previous vaginal plastics and suspen sion			3	20
Repair of complete perineal tear and suspension			2	
Repair of complete perineal tear				1
Amputation of cervix and vaginal plastics			5	
Abdominal fixation of uterus causing dystocia			1	
Previous vesico-vaginal fistula (repaired)				1
Congenital malformation of vagina obstructing labor		1		
Elderly primipara, rigid soft parts			1	3
Cervical dystocia		4		
Central placenta previa		2	5	14
Marginal placenta previa				2
Lateral placenta previa				1
Abruptio placentae		4		1
Uterine apoplexy, toxemia of pregnancy			5	2
Valvular heart disease, mitral stenosis and regurgitation			6	7
Valvular heart disease, aortic regurgitation and mitral regurgi tation			1	
Thyrocardiac				3
Previous multiple myomectomy				1
Multiple myomectomy, fifth month of pregnancy				1
Advanced pulmonary tuberculosis				1
Bilateral congenital hip disease				1
Chronic nephritis				2
Total	2	61	160	292

TABLE VIII

ANESTHESIA

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal inci sion	Trans verse inci sion
Local				
Anesthesia			5	19
Spinal				
Anesthesia		1	4	38
Avertin and				
Nitrous Oxide				
Oxygen				
Anesthesia				17
Nitrous Oxide				
Oxygen Ether				
Anesthesia	2	60	151	218
Total	2	61	160	292

on a woman in good physical condition should be different from that performed for uterine apoplexy, toxemia, chronic nephritis and valvular heart disease with decompensation

The 515 cervical cesarean sections reported were performed in 37 hospitals varying in equipment from that of the modern maternity center to that of the small town general hospital. From the standpoint of fetal mortality it is not difficult to concede that a new-born will have a better chance of surviving, especially if premature, in the well-appointed, well-heated and well-ventilated nursery than when placed in an ordinary room lacking these facilities, even though it is also called a nursery.

The mortality figures given represent gross mortality figures. None of the statistics were corrected.

EXTRAPERITONEAL

The woman who had an extraperitoneal cesarean section and recovered was subsequently delivered by a Porro cesarean section because she was again admitted after a long labor and frankly infected. The bladder was adherent on the left side of the uterus but was separated without undue difficulty in performing the hysterectomy.

TABLE IX
POSTOPERATIVE COMPLICATIONS

	Extra perit- oneal	Trans perit- oneal	Intraperitoneal Longi- tudinal inci- sion	Trans verse inci- sion
Septic uterus with utero-abdominal fistula		9		
Sepsis of abdominal incision		1	3	9
Low grade uterine sepsis				2
Pulmonary infections—(Pneumonia, Influenza, Bronchitis)			2	11
Thrombophlebitis			6	6
Pyelitis			2	8
Lochiometra			2	6
Dilatation of stomach			4	5
Postpartum eclampsia			1	1
Intestinal paresis				2
Recurrent pelvic inflammation				1
Puerperal psychosis				1
Pulmonary embolism (small embolus and recovery)			2	
Acute mastitis (no abscess)			1	

TABLE X
MATERNAL MORTALITY

Type of Operation	Number	Maternal Death	Per Cent
Extraperitoneal (Latzko)	2	1	50.0
Transperitoneal (Veit Fromme-Hirst) (Peritoneal Exclusion)	61	5	8.1
Intraperitoneal			
Longitudinal incision	160	9	5.6
Transverse incision	292	7	2.3
Total number of operations	515	Deaths 22	Per Cent 4.2

TABLE XI
MATERNAL DEATHS

By Causes

22 deaths in 515 operations 4.2 per cent

Pulmonary embolism	5—	0.97 per cent
Gastric dilatation	2—	0.38 per cent
Uterine apoplexy	2—	0.38 per cent
Pneumonia	3—	0.58 per cent
Heart disease	4—	0.77 per cent
Septicemia	1—	0.19 per cent
General peritonitis	1—	0.19 per cent
Eclampsia	3—	0.58 per cent
Chronic nephritis		
myocarditis		
bronchitis		
emphysema	1—	0.19 per cent

TABLE XII
FETAL MORTALITY

	Extra perit- oneal	Trans- perit- oneal	Intraperitoneal Longi- tudinal inci- sion	Trans verse inci- sion
Stillborn		2	5	4
Macerated fetus		1	2	1
Prematurity		1		4
Atelectasis pulmonum		3		1
Congenital heart disease			2	1
Underdevelopment				2
Status lymphaticus				1
Hemorrhage of newborn				1
523 children were delivered 31 of whom did not survive a gross fetal mortality of 5.9 per cent.				

TABLE XIII

REPEATED CERVICAL CESAREAN SECTIONS

For the purpose of this study the operations done with a longitudinal incision are grouped together as are those which were performed with a transverse incision in the lower segment. The first three groups extraperitoneal transperitoneal and intraperitoneal with a longitudinal incision all having had longitudinal cervical incisions total 223. The second group consists of 292 operations with a transverse cervical incision.

CERVICAL CESAREAN SECTIONS 515

With a longitudinal incision 223
With a transverse incision 292

REPEATED OPERATIONS

Longitudinal Incision		Transverse Incision	
6 cervical cesareans on 2 women	12	3 cervical cesareans on 8 women	24
5 cervical cesareans on 1 woman	5	2 cervical cesareans on 29 women	58
4 cervical cesareans on 5 women	20		
3 cervical cesareans on 12 women	36		
2 cervical cesareans on 46 women	92		
Total	165	Total	82

TABLE XIV
CERVICAL SCARS*Longitudinal Incision*

165 operations on 66 women, therefore,
99 previous scars examined.

93 scars solid and invisible to the naked eye
3 scars (3.2 per cent) were defective
2 scars were thin.
1 scar partly extended in body of uterus,
was healed in lower segment, thin in its
corporeal portion.

Transverse Incision

82 operations on 37 women, therefore,
45 previous scars examined

40 scars solid and invisible to the naked eye
3 scars identified as thin lines
2 scars (4.4 per cent) defective
1 scar at the fifth cesarean was thin.
1 scar at the third cesarean had a thin area
below incision

There were no ruptured scars in this series of cases

TABLE XV
PELVIC DELIVERIES FOLLOWING CERVICAL CESAREAN SECTION*Longitudinal Incision*

8 parturients were delivered through the pelvis
Medium forceps 2 women
Scanzoni maneuver 1 woman
Medium forceps, then delivery of twins,
one by low forceps, the other
by version and extraction 1 woman
3 normal deliveries 2 women
2 normal deliveries 1 woman
1 normal delivery 1 woman

Transverse Incision

6 parturients were delivered through the pelvis.
Version and extraction 1 woman
Normal delivery, (2) Scanzoni,
(3) Scanzoni, (4) Normal delivery 1 woman
Scanzoni maneuver 1 woman
Medium forceps 1 woman
Low forceps 1 woman
Normal delivery 1 woman

14 women had 23 pelvic deliveries 24 babies were born, 23 lived
One premature 6 months, normal delivery, lived a few hours
All puerperia normal

TABLE XVI
POSTOPERATIVE ADHESIONS

	Extra perit oneal	Trans perit oneal	Intraperitoneal Longi tudinal incl sion	Trans verse incl sion
Bladder adhesions	1		2	1
Peritoneal adhesions		22	13	15
Omental adhesions			7	1
Peritoneal and omental adhesions				2
Uterine adhesions				1
Total	1	22	22	20

TRANSPERITONEAL

This operation was not repeated but 22 women had intraperitoneal cervical cesarean sections performed subsequently, either with a longitudinal or transverse incision of the lower segment. In these 22 women a band of peritoneum, varying in width, was found extending from the cervix to the parietal peritoneum. This band was resected before separating the bladder a second time.

INTRAPERITONEAL

Longitudinal Incision

Adhesions were encountered in 22 patients, one band of peritoneum from the bladder to the abdominal incision in 8 women, 2 bands in 4 women and 3 bands in 1 woman. A small omental adhesion to the parietal peritoneum in

5 women and a small omental adhesion to the uterine fundus in 2 women. In one of these it was the fourth and in the other the third operation. The bladder was adherent to the parietal peritoneum in 2 instances.

INTRAPERITONEAL

Transverse Incision

Adhesions were found in 20 patients. A single omental adhesion to the abdominal scar was encountered six times. One thin band of peritoneum was noted in three women, two thin bands of peritoneum in two women and three thin bands of peritoneum in two women. In one woman two bands of peritoneum and one omental adhesion to the abdominal scar were discovered. In one patient there existed one band of peritoneum and one omental adhesion to the uterine fundus. The uterine body was ad

herent to the abdominal scar in one instance. Firm peritoneal adhesions in the region of the bladder were met once. In one woman who had had a classical and a transverse cervical cesarean section one band of peritoneal adhesions was found adherent to the classical scar, none to the cervical. In another patient who had had one transperitoneal, three intraperitoneal with longitudinal incisions and one intraperitoneal with a transverse incision, a small omental adhesion was found at the upper angle of the abdominal incision, when performing the sixth operation. In still another patient there was a band of peritoneum extending from the bladder to the parietal peritoneum at the second intraperitoneal operation with a transverse cervical incision.

There were 144 repeated operations, deducting 22 transperitoneal operations (peritoneal exclusion) in which we always find a band of adhesions, we have 122 cases for study. Of these 122 cases 42 had adhesions as described above and 80 had no adhesions whatsoever. The very important point in this study is the fact that in 144 repeated operations no intestinal adhesions of any kind were encountered.

SUMMARY AND CONCLUSIONS

Five hundred and fifteen cervical cesarean sections are reported as follows: extraperitoneal 2, transperitoneal 61, intraperitoneal, with a longitudinal cervical incision 160 and intra-

peritoneal, with a transverse cervical incision 292.

These operations were performed by one operator in 37 hospitals varying from the large maternity hospital to the small town general hospital.

The cervical cesarean section protects against septic peritonitis, is responsible for better healing of the incision and permits an easier convalescence.

The cervical cesarean section may be repeated with ease. Two women each had six operations (Table XIII).

In 144 repeated operations no intestinal adhesions of any kind were found.

Fourteen women had 23 pelvic deliveries following cervical cesarean section, resulting in the birth of 24 children. The puerperia were all normal.

The uncorrected maternal mortality was 4.2 per cent. The best mortality figures were obtained in 292 consecutive transverse cervical cesarean sections, where it was 2.3 per cent.

The gross fetal mortality, including stillborns, was 5.9 per cent (Table XII).

An efficient test of labor may safely precede this operation, thus allowing a number of women to be delivered through the pelvis who otherwise might have been delivered abdominally.

In performing the intraperitoneal operation I prefer the transverse cervical incision to the longitudinal since by so placing the incision, its extension into the uterine musculature is prevented.

BERIBERI SECONDARY TO SHORT-CIRCUITED SMALL INTESTINE

BY THOMAS V. URMY, M.D.,† B. HARRISON RAGLE, M.D.,† ARTHUR W. ALLEN, M.D.,† AND
CHESTER M. JONES, M.D.†

INTEREST in the so-called deficiency states has long been active by reason of such well-defined clinical entities as pellagra, beriberi, and scurvy. Recently it has been greatly increased through the recognition of many other definite conditions of ill health apparently due to prolonged subsistence on what have been called suboptimal if not wholly deficient diets. It has also been more clearly appreciated that the nutrition of an individual is conditioned not only by the food eaten but just as importantly by its degree of digestion and absorption. In fact in this section of the world, though there exist many borderline states of avitaminosis in otherwise normal people, the full-blown picture of one or more of the classical deficiency diseases is rarely seen in the absence of some defi-

nite gastro-intestinal lesion. In pellagra this relationship has been amply shown by the reports of Barnes¹, Turner², Eusterman and O'Leary³, and Boggs and Padgett⁴. Scurvy in cases of chronic digestive disorders, especially ulcer, is not very uncommon in any large hospital clinic, though here, perhaps, self-limitation of diet because of symptoms is a greater factor than vomiting or other inadequacy in digestion itself. Beriberi has from our experience and review of the literature, been a much less common complication, and for this reason we have thought it worth while to report the following case in which its clean-cut manifestations developed slowly after the establishment of a large blind loop of small intestine. Since encountering this case we have seen another instance in an ulcerative colitis patient with ileostomy, recently reported by one of us⁵. There has also been observed a third case⁶, which showed only the neurological features of beri-

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beri two and one-half years after the establishment of an enterostomy between the stomach and lower ileum. Suitable therapy brought striking improvement in all three of these patients.

Though two of the patients had such similar anatomic findings as to suggest that there may be some specific relationship between this particular defect and beriberi, it would be difficult to prove it on our present knowledge. Little, Zerfas and Trusler⁷ have reported a case with a very similar operative story who developed typical pernicious anemia despite the finding of normal gastric acidity. There was nothing to suggest beriberi. It would seem most logical to consider that a short-circuiting of the small bowel, such as we observed, causes only a marked general impairment of absorption. An imbalance in diet or some idiosyncrasy in the patient probably determines the particular syndrome to be developed.

CASE REPORT

In May, 1926, a forty seven year old native retired lawyer twice developed intestinal obstruction during convalescence from an interval appendectomy. He was finally left with a hastily done lateral anastomosis between small intestinal loops which short circuited an unknown length of bowel. Immediately the patient began to have diarrhea. It was limited almost entirely to the night, when there would be from four to six bulky, semi formed or liquid stools containing large amounts of fatty acids and soaps and some fat. At the same time he developed a tremendous appetite and took three very large and varied meals daily. Two months after his original operation his weight had fallen from 168 to 115 pounds.

A few months later he began vomiting about once a day always in the evening after his supper. His hunger would force him to eat another large meal as soon as the vomiting had ceased.

When seen one year after operation the patient had gained no weight. He was very thin, flushed and anxious looking. The tongue was a brilliant red, although not sore. The blood pressure was low, 95 systolic and 70 diastolic and there was remarkably active peristalsis visible through his thin abdominal wall. In an effort to check the diarrhea the patient was put on a dry, low residue diet which consisted chiefly of toast, potatoes, thick cereal, rice, boiled milk, chicken and fish, to which after a few months other meats and small amounts of cooked vegetables were added. On the new diet the diarrhea rather quickly stopped excepting for an occasional attack. He began having normally one movement during the night and one or two early in the morning after rising. The stools still contained large amounts of fat and fatty acids.

At the end of six months or one and one half years after operation the patient had gained 25 pounds. The unusual redness of the tongue had disappeared. However he had begun to complain of a feeling of pressure across the left chest on exertion. He had also noticed a slight swelling of the feet and lower legs. The heart was found rapid with sounds of fair quality. There was a systolic murmur heard at apex and base. An x ray showed no enlargement. The blood pressure was 160 systolic and 80 diastolic. The lungs were clear. There was no ascites. The gait had a certain unsteadiness

although there was no real ataxia. The knee jerks were not obtained. There was some slight decrease in tactile sensation in the feet. Position sense was retained. An electrocardiogram was essentially normal, with auricular and ventricular rates of 90, regular rhythm, and a conduction time of 12 seconds. The QRS was greater than QRS₂. The QRS and T waves were inverted in lead III.

At this time small amounts of orange, grapefruit, pineapple and tomato juices, to a maximum of not over three or four ounces daily, were added to the diet. The legs improved somewhat and the patient was able to carry on fairly comfortably until the fall of 1928, two and one half years after operation, when increasing weakness, particularly of the legs, developed.

He now showed marked emaciation and apparent wasting of the muscles generally, though there was better strength in all groups than the appearance suggested. His weight was 135 pounds, stripped. There was no tenderness over the nerve trunks. The gait was weak with definite difficulty in raising the toes, but true foot drop was not present. The muscles of the thighs and calves showed symmetrical atrophy, less striking in the feet because of swelling. The feet perspired freely. There was moderate tenderness over the calves and thighs. The left knee jerk was not obtained, and the right only with reinforcement. Neither of the Achilles jerks was obtained, nor was there plantar response. There was diminished pain sense in the feet, but touch, temperature, vibration and position senses were present. The Romberg test was slightly positive.

The patient began going steadily downhill with increasing weakness, numbness and tingling of the feet, loss of weight, palpitation and dyspnea. He developed much discomfort and actual distress in the epigastrium which came two or three hours after meals but was not relieved by food. His appetite remained enormous. For the first time since operation he became constipated enough to require mineral oil for a daily bowel movement.

In February, 1929 an acute respiratory infection aggravated all symptoms, so that the patient was finally readmitted to the hospital in March, 1929. Nearly three years had elapsed since his original operation.

He was now completely exhausted. The pulse rate was 100, the blood pressure varied from 100/70 to 150/90. There was slight deep tenderness high in the epigastrium. Peristalsis was visible and active. There was slight edema of the feet. The patient was so weak that he could not move his feet both of which now showed definite toe drop. He was given a transfusion soon after admission and was treated with digitals and sedatives, but his course was nevertheless steadily downward. There was a series of attacks of low substernal pain and pressure associated with pallor during which the patient would attempt to sit up. Nitroglycerine relieved them. Constipation became marked.

The red blood cell count was 3,700,000. Hemoglobin was 75 per cent. White cells numbered 7,400 with a differential count of neutrophils 74 per cent, lymphocytes 13 per cent, large mononuclears 12 per cent and eosinophiles 1 per cent. The general blood picture was that of mild secondary anemia. The urine was negative to routine examination excepting for occasional red blood cells and small amounts of albumin due probably to renal stones which had been discovered six months after operation. The stools still contained moderate amounts of undigested muscle fibre and neutral fats in addition to rather large amounts of soaps. The serum calcium was 10.2 mgs per 100 cc and the serum protein 9.8 per cent. A sugar tolerance curve fol-

lowing the ingestion of 100 Gm of glucose showed values ranging from 79 mgs fasting to 153 mgs at one half hour, 178 at one hour and 166 at two hours. A gastric analysis showed normal acidity. A duodenal analysis revealed a free flow of bile, grossly and microscopically negative. Tests for pancreatic enzymes by the method of McClure Wetmore and Reynolds⁸ showed an amylase of 17 mgs and protease of 30 mgs, both well within normal limits but no lipase.

Roentgen examination demonstrated the short circuited bowel and much stasis in the lower ileum and cecum. It was impossible to determine the exact sites of anastomosis or the length of functioning small intestine.

The patient's voice became so weak that it could not be raised above a whisper.

About a month after entry a second transfusion was given. At this time also he started to take a concentrate of brewer's yeast with doses as high as eight teaspoonfuls daily. This was supplemented by small amounts of cooked vegetables, liver extract, fruit juices and other vitamin preparations. Later cod liver oil was added and for a time small doses of insulin were given in an attempt to improve his nutrition. After about a month there was slight but definite benefit. The bowels were less constipated. There was a good deal less of abdominal discomfort and no anemia (he had had a third transfusion meanwhile). The power in the legs almost completely gone soon after entry had begun to return while the voice had come up from a whisper to a moderately normal one. The appetite remained good. As his strength gradually increased he was put on graded orthopedic exercises.

In August, 1929, four months after beginning the yeast powder the patient had gained a little weight was stronger and although he tired easily was walking about a little with the aid of braces. He had an uncertain tabetic type of gait though tests of position sense in the feet were performed fairly well. The latter were still held in a position of equinovarus due to the very weak peroneal groups. He was having daily bowel movements without cathartics or enemas. The pulse rate had fallen from 100 to 80. The stools were pale yellow pasty and microscopically well digested excepting for moderate quantities of fatty acids and soaps.

He was discharged home in August, 1929 on a generous mixed diet plus four teaspoonfuls of brewer's yeast concentrate and four vials of Lilly's liver extract No 343 daily. At home there was gradual improvement in weight strength and muscle tone to an extent that it was finally considered feasible to attempt to restore the normal bowel sequence.

The patient was re-admitted to the hospital in November 1929 and after three blood transfusions operation was performed. Adhesions involving the entire small bowel were systematically freed. A huge dilated jejunum was found to connect at about its mid portion with the terminal ileum. This had left perhaps twenty four inches of functioning small intestine. The entero-enterostomy was disconnected. Fifty cubic centimeters of amniotic fluid were put into the abdominal cavity before it was closed.

At once fatty elements and muscle fibers disappeared from the stools.

Steady general improvement followed and by the end of six months he was leading a fairly active life.

When examined in August 1932 two and one half years after his final operation he was feeling fit as a king and could do a full day's work at a carpenter's bench or play thirty six holes of golf without undue fatigue. There was no cardiac symptom. His appetite and digestion were excellent and

his bowels were moving normally once a day. He felt that his voice had never quite come back to its full strength and former character. His feet were still somewhat troublesome, certainly his greatest handicap, for though he walked without fatigue there was still some uncertainty, and a fear that he might trip. The soles of the feet felt as though they were 'all tendons'.

Physical examination showed him lean, tanned and apparently very well. His weight was 146 stripped. The heart was not enlarged to percussion. It was regular had normal sounds and a rate of 68. The blood pressure was 125/60 recumbent and 125/65 sitting. The patient walked with his feet somewhat apart, toeing out and 'slapping' slightly. There was some little difficulty in walking a line and perhaps a slightly positive Romberg test. The deep reflexes in the arms were present they were sluggish on the left. Those in the legs on both sides, were barely obtained with reinforcement. The plantars gave a faint normal response. The abdominal reflexes were present. The cremasterics were absent. Vibration sense was present but diminished in both legs. Tactile and pain sensations were normal all over. Position sense in the fingers and toes was normal and heel to knee and finger to nose tests were performed accurately.

In September 1932, the stone in the right kidney was successfully removed through the lumbar route. Convalescence from this operation was uneventful.

COMMENT

There is little room for doubt that this patient had beriberi. The nerve manifestations, including the virtual aphonia presumably due to tenth nerve involvement, the cardiac symptoms with the absence of evidence of other types of heart disease and lack of response to digitalis, and the edema, were all quite typical. Constipation, usually present in this disease, developed despite the underlying tendency to diarrhea. However, anorexia, also to be expected, never supervened on the ravenous appetite which began immediately after his enterostomy in 1926.

The improvement which started with the addition of yeast to his diet and which became rapid after his normal bowel sequence had been reestablished suggests definitely that the patient's difficulty was primarily a deficiency of a yeast-contained substance and that this deficiency was dependent chiefly, if not solely, on a lack of adequate absorptive area in the intestines.

It is interesting to note how the acute infection in the winter of 1929 greatly accentuated the deficiency manifestations, apparently a characteristic of all syndromes resulting from avitaminosis.

In the spring of 1929 the absence of lipase on duodenal analysis, the decreased sugar tolerance, the steatorrhea, and perhaps also the epigastric pain, pointed to definite pancreatic involvement which, though an ordinary pancreatitis could not be entirely ruled out, was probably further evidence of avitaminosis. It is of interest to recall the work of Lepkovsky, Wood and Evans⁹, who found in rats on diets

deficient in the anti-neuritic vitamin, some decrease in the glucose tolerance as the final breakdown was reached

The animal experiments of Osborne and Mendel¹⁰, Fujimaki¹¹, and McCarrison¹², give occasion for conjecture concerning the part played by lack of fat soluble vitamin in the formation of the renal stones discovered in our patient about six months after operation. It seems reasonable to suppose that due to his fat intolerance he absorbed very little of vitamin A even though he gave no other manifestations of such a deficiency

SUMMARY

Typical beriberi developed gradually following an entero-enterostomy for relief of acute postoperative intestinal obstruction. Definite improvement followed the administration of large doses of dried yeast, but permanent and virtually complete relief did not come until a large blind loop of small intestine was restored to its normal sequence.

Renal stones which developed during the pe-

riod of short-circuited bowel may have been the result of a gross failure to absorb vitamin A.

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OXYGEN THERAPY BY THE OPEN BOX METHOD*

BY ALEX M. BURGESS, M.D.,† ASA S. BRIGGS, M.D.,† AND ALEX M. BURGESS, JR.†

THE therapeutic use of oxygen has become so important, especially in the treatment of pulmonary and cardiac disease, that any method which increases the ease and efficiency of its application or decreases its cost is worthy of consideration. At present the methods available to the practitioner and to the smaller hospitals are not as a rule satisfactory. The modern tent, which is efficient, is also expensive and cumbersome, and the portable oxygen room, while more efficient, is also still more expensive and cumbersome and hardly appropriate for the use of the crossroads doctor or rural hospital.

In a preliminary note published recently¹, two of us have described a method of administration based on a new principle. This principle is, stated in its simplest terms, the fact that when oxygen, which is slightly heavier than air, is introduced at a reasonable speed into the bottom of a container which is impermeable as to its walls and floor but open at the top, there will be maintained in the lower part of the container an atmosphere relatively rich in oxygen in spite of free diffusion upwards. Using cardboard boxes of various sizes we showed that the concentration of oxygen† at a given level in the box varied directly with the

speed of oxygen inflow and depth of the box and inversely with its capacity. In a box 19½ x 13¾ x 18½ in. in depth, for example, with an inflow of four litres per minute, we found at a point six inches above the floor of the box a constant concentration of over 70 per cent oxygen. In order to apply a box of this general description to a patient it was necessary to devise a leak-proof curtain through which the patient's head could protrude into the box. The curtain mentioned in the preliminary note has since been discarded for the one which is described below. It was, however, sufficiently efficient to accomplish its main purpose and we were able to show that normal individuals and several patients on whom the apparatus was tested could be made to breathe concentration of 40 to 50 per cent oxygen by the use of this box and with oxygen inflow of four to five litres per minute. We had, at that time, not yet developed an adequate method of controlling humidity and temperature within the box. Our object in publishing the preliminary note was to make known the principle to others interested in the subject who might be able to perfect the method.

The present communication deals with our further modifications of the apparatus and clinical application of the method. With the adoption of a more efficient curtain and the development of an ice cooler which gives adequate control of humidity and temperature², we have found the apparatus to be applicable to

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many patients needing oxygen therapy over long periods

DESCRIPTION OF APPARATUS

At present we are using two types of apparatus. The first (figs 1 & 2) is intended to contain an adult patient's head or the head, thorax and arms of an infant. It consists of a wooden box measuring 20 x 20 x 18 inches of which the top is open and the bottom and lower two-thirds of the front wall are also left open and covered with a rubber curtain as shown in the diagram (fig 1). This rubber curtain is at-

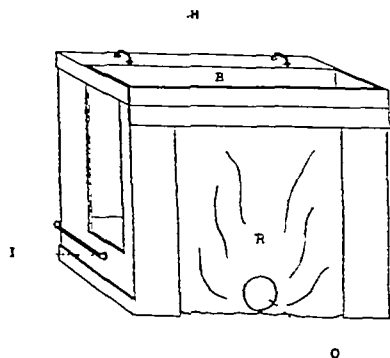


FIG 1. Diagram of box.
R = Rubber curtain.
O = Opening for patient's head.
B = Baffle plate
H = Handle for raising baffle plate
I = Oxygen intake tube

tached by metal clamps to the inside of the box along the side walls and across the back wall thus forming an elastic impermeable floor to the box, and up on either side of the opening in the front wall. In the lower part of the curtain which, when attached, completes the front wall

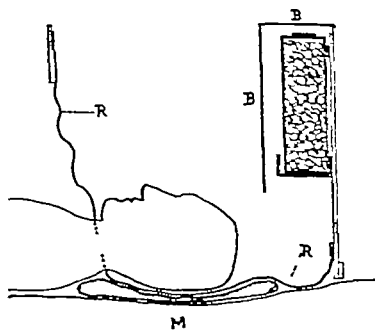


FIG 2. Diagram representing sagittal section of box in use.
R = Rubber curtain.
B = Baffle plate covering ice container
M = Mattress

of the box is a hole for admitting the patient's head. The hole is three, four or five inches in diameter in different curtains and in use the proper curtain is chosen to fit the patient's neck or infant's abdomen as the case may be. The curtains are made of rubber such as is used in making surgeon's gloves and the hole is easily stretched to go over the patient's head, and fits

snugly around the neck without unpleasant constriction. In use the part of the curtain which forms the floor is covered with a folded sheet or very thin pillow.

The sides of the box contain windows of cellulose acetate. Below these windows are the openings of the oxygen inflow tubes. Below the oxygen inflow openings are the clamps for attaching the rubber curtain as noted above. The back wall of the box is without a window and to it the ice cooler is attached. The ice cooler consists of a metal box which fits into a metal outer frame whose bottom part acts as a tray to receive the drip as moisture condenses on the cold surface of the cooler. Over this cooler and fitting snugly to the edges of the box is a "baffle plate" or metal cover which extends down in front of the cooler to within about two inches of its bottom and leaves a space of about two inches between it and the front of the cooler. This prevents outside air from coming in contact with the cooler and forming a downward current into the box which would tend to drive out oxygen-rich air and destroy the efficiency of the apparatus as explained below. It has been found that a cooler made of wire mesh with a tray below it which drains through a pipe to the outside is also a very good type of cooler, probably even more efficient than the one described. Furthermore for the "baffle plate" or metal cover a rubberized cloth cover may be substituted.

By means of the cooling apparatus described it was found possible to keep the temperature and humidity inside the box at or below room temperature and room humidity. When the cooler was first tried without the cover it was discovered that although temperature and humidity were well controlled the oxygen percentage at the level of the patient's nose was, at an inflow of 5 litres per minute, constantly below 40 per cent. This is illustrated in figure 3 in which the variations in oxygen percentage, temperature and humidity are charted both with and without the use of the uncovered cooler. This result we judged to be due to the creation of a downward current of outside air as mentioned above, which tended to drive out the oxygen-rich air from the lower layers of the box. The cover was devised to prevent this and allow only oxygen-rich air to come in contact with the cooler. This is illustrated graphically by figure 4. When the cooler was used with the cover it was found possible to obtain good therapeutic concentrations of oxygen (45 to 65 per cent) at the level of the patient's nose with, at the same time adequate temperature and humidity control. This is shown in figure 5. Figure 6 illustrates the importance of minute leaks, and also shows carbon dioxide values obtained in a three hour test of the box.

The second type of box in use is the larger box intended to contain an entire infant. These

vary somewhat in length but are 18 inches deep and fitted at one end with a cooler and cover such as has been described above. The oxygen intake tubes are located in the side walls near the bottom of the box and about 8 inches from the end of the box which contains the cooler. The bottom of the box is made of impermeable rubberized cloth. As the entire patient is to be contained in the box, of course no curtain is

boxes and have shown prompt improvement and eventual recovery. With a flow of five to six litres per minute the infant in these boxes has been shown to receive from forty to sixty per cent oxygen.

CLINICAL EXPERIENCE WITH THE METHOD

As regards the clinical use of the first type of box described, the "head box" as it is usually



FIG 3 Chart showing effect of uncovered ice cooler on humidity temperature and oxygen concentration in box when in use on a patient. All air samples taken at bridge of patient's nose. Rate of oxygen inflow 5 litres per minute. Time in minutes.

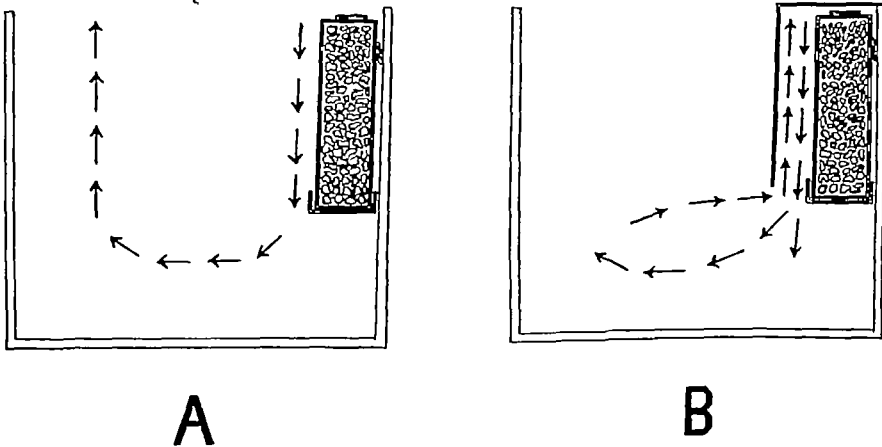


FIG 4 Diagram illustrating the probable effect of the ice cooler on air currents in the box. A—without cover B—with cover.

necessary and leaks cannot occur. This type of apparatus is preferred by some of the local pediatricists who are using these boxes in their routine clinical work. It is slightly less efficient than the other type but has been giving very satisfactory results on the pediatric service at the Rhode Island Hospital during the past winter. In a number of instances cyanotic, apparently moribund babies have been placed in these

called, we have seen the same striking results as are obtained by any efficient method of oxygen administration. Our experience has been for the most part limited to its use in pneumonia and cardiac disease. When we compare it with other methods we find that in adults it is sometimes better tolerated than the tent and sometimes better than the nasal catheter. It has the advantage over the tent that feeding and

treatment can be given freely through the top without interfering with the apparatus at all while physical examination of the chest and the rest of the body as well as sponging, the slant of the patient's trunk and the top is raised too high from the floor to allow of easy access to the patient's face for feeding and treatment unless the whole bed can be lowered

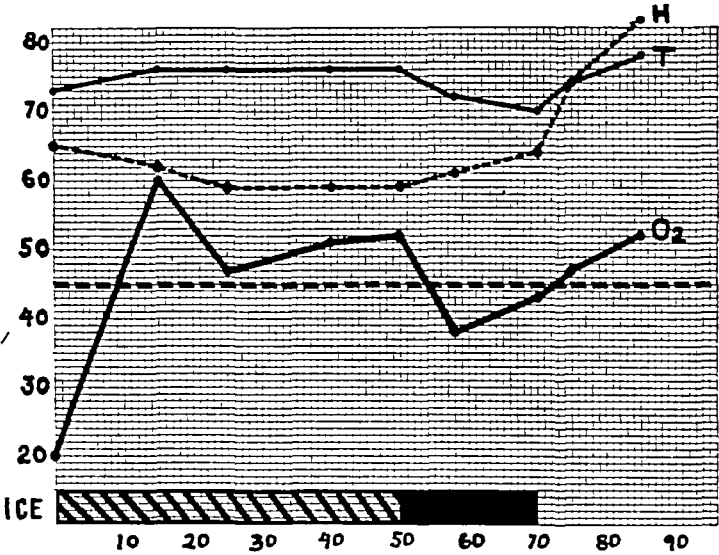


FIG 5 Chart showing effect of cover over ice cooler on oxygen percentage, temperature and humidity. The cross-hatched block represents time when ice cooler was in use with cover, solid block when it was used without cover and during the remainder of the test the cooler was removed. Rate of oxygen flow—5 litres per minute. Time in minutes.

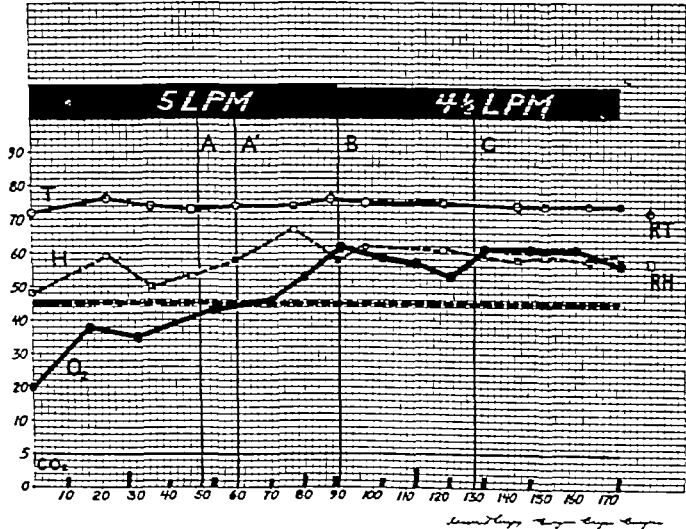


FIG 6 Chart showing 3 hour test of box on a normal adult illustrating importance of small leaks on oxygen concentration and also showing CO₂ values—Flow 5 and later 4½ litres per minute. Time in minutes.
A and A' = Time when small leaks in attachment of curtain were discovered and stopped
B = Change in rate of oxygen inflow
C = Aperture of box half covered by a cloth
R. T. and R. H. = Room temperature and room humidity at end of test.

enemata, etc., can be carried out also without any interruption of the treatment. In patients who are markedly orthopneic it is usually inferior to either of the other methods mentioned as the whole apparatus has to be adjusted to In some instances, however, after treatment had been begun by another method the patient later could lie more nearly flat and the box proved to be superior for the latter part of his oxygen treatment.

In children and in infants we consider the use of the box to be the method of choice and superior to the other methods which we have had an opportunity to study. For the Providence Lying-In Hospital a very small box has been constructed for premature infants which gives strikingly satisfactory results.

During the first six months of the year 1933 the method was used in about sixty cases in Providence. At the Rhode Island Hospital the head box was used on adults and children while in the case of infants the larger box was employed. The box method has also been in use at the Charles V. Chapin and Lying-In Hospitals, and in the private practice of several physicians.

In adults the method has been successfully applied to a number of cases of pneumonia with cyanosis. Of the few patients with heart disease in which it has been used the following notes give a striking example.

M. C. 66 years. Female. Unmarried—housekeeper. Family history and past history irrelevant except that she is said to have had a definite arterial hypertension and a slight glycosuria.

She was admitted to the Rhode Island Hospital on February 20, 1933, in a comatose condition. A history obtained later showed that while on the way to church she was taken with a sudden smothering sensation and dyspnea. On admission within an hour of the onset she was found to be very cyanotic, this being especially evident in her lips, fingers and ear lobes. Pupils were normal. The lungs showed crackling râles in both axillae and were not examined in back. Blood pressure was not obtainable. Heart sounds were practically inaudible.

Following admission cyanosis became more marked and respirations periodic. She was given coramine 1 cc, adrenalin 0.65 cc and caffeine sodium benzoate 0.5 gram subcutaneously. When seen by one of the writers about one and a half hours later she was deeply cyanotic and pulseless at the wrist and appeared moribund.

She was placed in the oxygen box with the flow begun at seven litres per minute and later reduced to five. At the end of three hours her color was normal, her pulse good and her heart sounds regular and of fair quality.

An electrocardiogram suggested coronary occlusion. After a long and rather difficult convalescence in which a second coronary episode occurred with the appearance of a pericardial friction rub the patient was discharged from the hospital on May 25, 1933.

In using the method in infants and children many very striking results have been recorded including the recovery of several apparently moribund patients suffering from pneumonia. The case of a little girl seen by Dr. H. E. Utter in consultation in the country is not only a very good example of the use of the method but also of its applicability to patients in rural communities where more expensive and elaborate apparatus is not available. This child of five had been ill for several days and when seen by him showed evidence of a bilateral bronchopneumonia. She was cyanotic and restless and had had almost no sleep for several days. Both

family physician and consultant considered the prognosis as extremely bad. An oxygen box of the "head-box" type was obtained. Five minutes after the patient was put in the box she was asleep and her color, respirations and pulse rate was noticeably improved. She was kept in the box for thirteen days and made a perfect recovery.

At the Providence Lying-In Hospital the method has become routine for premature infants and has been used in more than thirty cases. Three of these are to be reported by Dr. W. P. Buffum, Jr. The small box which has been constructed for this work takes the entire infant and requires a flow of but $1\frac{1}{2}$ litres per minute to give the required oxygen percent age (Fig. 7).

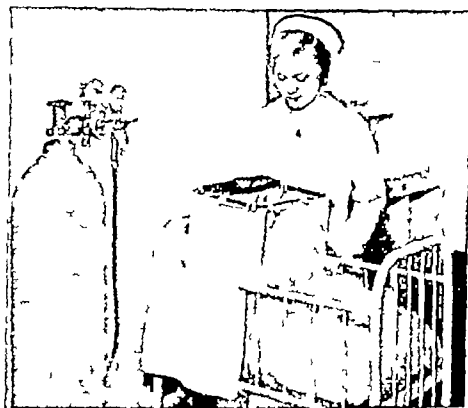


FIG. 7. Small box used for premature infants. (Courtesy of Providence Lying In Hospital.)

If, as seems likely, further experience corroborates our early impressions of the use of this method it will doubtless be possible so to modify the apparatus that its convenience and efficiency will be greatly enhanced. Further more, in the construction of the larger tents it seems to us probable that by applying the same principle exemplified in the box which we have described, that is, by making the bottom leak proof by an impermeable rubber curtain through an opening in which the patient's body projects into the tent, and by having all openings of the tent high enough to prevent escape of the oxygen-rich air of the lower levels, a much greater efficiency could be obtained.

SUMMARY

1. A new method of oxygen therapy is described based on the principle that if oxygen is introduced at a reasonable speed into a box with impermeable walls and floor but with the top open, a high concentration will be maintained in the lower part of the box despite free diffusion upwards.

2. A cheap and easily constructed apparatus for applying this method is described.

3. By the use of this apparatus patients

can be made to receive from 40 to 65 per cent oxygen with a flow of four to five litres per minute, and adequate control of temperature and humidity is obtained

4 Clinical experience with the method shows that it is efficient in adults though not always the method of choice. In infants and children it has proved, in the hands of the writers, superior to all other methods used

5 The simplicity of the method and the in-

expensiveness of the apparatus make it especially appropriate for the use of general practitioners and small hospitals

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FOUR SYNCHRONOUS CANCERS OF THE SMALL INTESTINE

A Case Report

BY J F BALDWIN, M D *

IN the *New England Journal of Medicine* of May 18, 1933, Dr Everett D Kiefer, of the Lahey Clinic, Boston, published an interesting paper, based largely on the Clinic records, on the subject of "Tumors of the Small Intestine." From this paper it seemed that while malignant tumors of the small intestines are relatively exceedingly rare, no case of multiple malignancies had apparently been recorded. His statement seemed to be fully verified in the chapter on Cancer of the Intestines in the work on *Cancer* edited by Herbert J Paterson, with a Preface by John Bland-Sutton, published by William Wood & Company in 1925. Because of the apparent rarity of cases of multiplicity of cancer, the following brief report may be worth recording.

W H R., Versailles Ohio aged 59 Nov 20 1909 Patient, an active physician had always enjoyed good health but had been ailing for eight or nine weeks the trouble following a hearty dinner apparently as an acute attack of indigestion. The discomfort had been persistent in the region of the cecum, but he still had a good appetite no vomiting. His bowels were very much constipated, only moving as the result of physic. He had lost 25 pounds in weight, had a slight daily elevation of temperature and had not felt like doing any work, though he had not entirely given up.

Examination showed a little abdominal distention with considerable rigidity on the right side quite typical tenderness over the general region of the appendix none over the gall bladder. My notes read 'The case is very suggestive of a chronic or rather subacute appendicitis but malignancy cannot be positively excluded. As the pain comes on one-half hour to an hour after meals there is a possibility of trouble in the duodenum but the symptoms are not characteristic.'

I referred him at once to one of our leading gas

tro-enterologists, Dr J D Dunham who reported that in addition to chronic appendicitis he thought the patient suffered from an ulcer in the pylorus with beginning stenosis. In view of the rapid loss of weight and strength he also suspected malignancy.

When the patient was relaxed under the anesthetic thorough study of the abdomen failed to reveal anything new. The usual right rectus incision was made. The intestines were moderately distended, but nothing unusual appeared until the cecum was reached. It was then found that immediately above the ileocecal valve there were three distinct cancers each essentially spherical and about one inch in diameter all three within two feet so that a resection of the bowel removed all three. The usual lateral anastomosis was made. Running the bowel through the fingers disclosed a fourth cancer a few inches below the upper end of the jejunum. That portion of the bowel was resected and a lateral anastomosis made. General exploration failed to show any further evidence of disease. Of the four growths one of those in the lower end of the ileum was somewhat smaller than the others all of them involved the wall of the bowel each one materially narrowing its lumen. The specimens were referred to Dr J J Coons who later reported "Spheroidal-celled cancer undergoing some form of degeneration probably mucoid."

The patient made a smooth convalescence improved rapidly and resumed his active practice. Early in 1911 he commenced having trouble in the upper end of the esophagus and I saw him at his home March 12 1911. He was then in bad shape from esophageal obstruction with marked involvement of the glands of the neck. A superficial piece of tissue in the throat had been removed but had not been examined. There was no trouble in the abdomen. Another bit of tissue was removed for microscopic study and referred to the microscopist who had examined the original tumors. He soon reported as to the identity of all, and approved of the suggestion that the esophageal growth was primary and the others grafts from the lodgment of detached pieces.

The patient died May 22 1911 eighteen months after his operation. There was no autopsy.

Baldwin—Formerly Chancellor and Professor of Surgical Gynecology, Ohio Medical University. For record and address of author see *This Week's Issue* page 276

MEDICAL PROGRESS

PROGRESS IN TUBERCULOSIS 1932-1933

BY JOHN B HAWES, 2ND, M.D.,* AND MOSES J STONE, M.D.*

DIAGNOSIS

THERE has been no outstanding advance in the diagnosis of pulmonary tuberculosis but one cannot but notice with relief that the difference of opinion between clinician and roentgenologist is becoming less and less as time goes on

L Brown, *Am J Med Sc*, 182 700 (Nov) 1931, presents a study of 503 cases of pulmonary tuberculosis, each of which presented no definite or at least none of the physical signs. He emphasizes the importance of roentgen ray diagnosis in these cases.

R Hollman, *Klin Wchnschr*, 10 2359 (Dec 19) 1931, examined a total of 2,677 patients who were diagnosed by general practitioners as having tuberculosis or some other chronic pulmonary disease. He reexamined them with particular emphasis to roentgenological studies. Only 48 per cent of all the patients diagnosed as pulmonary tuberculosis actually had that disease, of 1,053 cases with a definite diagnosis 35 per cent had pulmonary tuberculosis and of 846 patients in whom tuberculosis was not suspected, nine per cent had tuberculosis. He emphasizes the necessity of roentgenological examination in all pulmonary patients.

R M Burke, *Minn Med*, 15 18 (Jan) 1932, found that of 2,096 patients admitted to the Glen Lake Sanatorium, 74 on examination proved not to have tuberculosis, 23 apparently normal, 29 having miscellaneous non-pulmonary conditions and 22 non-tuberculous pulmonary disease. In the second group the following diseases were represented, heart disease eight cases, intestinal disorders, five, syphilis, four, upper respiratory infections, four, carcinoma, two, arthritis, two, Hodgkin's disease, one, hyperthyroidism, one, actinomycosis, one, pregnancy, one. Non-tuberculous pulmonary infections were found as follows: bronchiectasis, 11, bronchitis, five, pulmonary abscess, two, asthma, one, empyema, one, blastomycosis, one, pulmonary fibrosis, one. In the group of non-tuberculous disease the most prevalent symptoms in the order of their frequency were tiredness or weakness, cough, slight elevation of temperature, chest pain, hemoptysis, abnormal x-ray shadows in the lung, loss of weight, night sweats, frequent colds and bronchitis.

Braeuning, *Klin Wchnschr*, 11 401 (Mar 5) 1932, emphasizes that practically all clinical tuberculous disease is preceded by an asymptomatic period during which, however, x-ray evidence of the disease is present. He therefore urges that no health certificate should be granted without x-ray examination.

TREATMENT

The outstanding advance in the treatment of tuberculosis has been the general acceptance of surgical measures by means of pneumothorax, phrenic nerve operation and thoracoplasty by the medical profession and particularly by those in charge of hospitals and sanatoria for the tuberculous. This alone is a tremendous step in advance.

R Massingham, *Lancet*, 2 757 (Oct 3) 1931, takes up the treatment of advanced pulmonary tuberculosis. He states that treatment of these cases is a psychological as well as a physical problem and that the "spes phthisica" must be kept alive. Relief of trivial symptoms is often possible and distracts the patient's mind from the hopelessness of his situation. He found that insomnia due to dyspnea and cough may be relieved by $\frac{1}{2}$ gr of ephedrine combined with a bromide mixture and taken at bed time. Hot milk, night and morning, shortens attacks of coughing when the sputum is profuse. A mixture of 15 gr of sodium bicarbonate, 5 gr of sodium chloride and 10 minims of spirit of chloroform in hot water also aids expectoration. Early stages of laryngitis should be treated by the direct cauterization. Later, nerve section or injection may be used. Silence is important. Benzoin inhalations are soothing. He recommends a mixture of equal parts of orthoform, anaesthesine and lactose for local anesthesia. If hypnotics are used he feels that it is wise to use a dose sufficient to produce sleep. Bromide, chloral hydrate and Dover's powder are recommended. Pain in the chest is treated with counterirritants. Strapping is usually impractical because of dyspnea. Terminal enteritis he treats by a reduced diet of low residue, opiates and bismuth. Cod liver oil and tomato juice are worthy of trial. He treats anorexia with a mixture of hydrochloric acid, strychnine and gentian. The aim of treatment should be to promote the comfort and happiness of the patient.

It is strange that he does not mention ultraviolet light for this.

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J Watt, *J State Med*, 39 311 (June) 1931, emphasizes that the sanatorium forms the keystone in the whole system of treatment of tuberculosis. But the most efficient utilization of the sanatorium demands that patients be allowed to stay only so long as they receive considerable benefit. Having learned the sanatorium methods they should be allowed to continue their treatment at home and be subsidized if necessary. He believes this to be more economical than carrying the patient on the sanatorium list indefinitely.

S A. Knopf, *J A M A*, 96 2023 (June 13) 1931, discussing the rôle of climate in tuberculosis states that when the sanatorium regimen can be conscientiously carried out whether in an institution or at home, climatic conditions are of secondary importance, but to deny the beneficial influence of certain climatic regions as a valuable adjuvant to the treatment of tuberculosis is as dangerous and unscientific as the belief in the specific curative quality of any particular climate. He feels that the ideal climate for the average patient with pulmonary tuberculosis in the earlier and more hopeful stages of the disease, is the one in which the extremes of temperature are not great, with only rare fogs, or none at all, with the purest possible atmosphere, with relatively little humidity, with much sunshine and with all conditions that permit the patient to live comfortably outdoors the greatest number of days of the year and the greatest number of hours of the twenty-four.

P H Ringer, *J A. M. A.*, 97 381 (Aug 8) 1931, takes up the question of home vs institutional treatment of tuberculosis. He feels that the patient is best cared for in an institution especially conducted for the treatment of this disease and in the majority of instances, at an appreciable distance from his home. In a few cases home treatment will work, in the majority of cases it will not. He finds that the patient taking the cure at home may obtain bodily quiet, but is constantly subject to three sources of irritation and disturbance, family, friends and business. Again a patient leaving home for treatment is filled with a purpose. The "esprit de corps" of a properly run institution is a factor that rarely exists in the home. It is a form of mass psychology as compared with individual psychology.

P Beeh, *Ztschr f Tuberk*, 58 235, 1930, gives the results of pneumothorax treatment in patients in whom it was successful and compares with results in patients in whom for various reasons it could not be instituted. Of the first group 38.5 per cent improved, 22.5 per cent unchanged and 39.5 per cent worse or died, while of the group without pneumothorax eight per cent improved, 33 per cent remained unchanged and 59 per cent became worse or died.

W Sachs, *Beitr z Klin d Tuberk*, 74 302, 1930, reports his experience with pneumothorax during the years 1920 to 1928 with 649 sanatorium patients. His results during the same period with non-treated cases, especially those in which pneumothorax could not be done show the advantages of compression treatment over conservative treatment, especially as to duration of life, ability to work and loss of bacilli. He also compares artificial pneumothorax treatment with phrenic exeresis and thoracoplasty. During the period of from two to ten years after treatment with pneumothorax, 8.1 per cent died, while of those who had had phrenic exeresis 13 per cent, and those with thoracoplasty 19.4 per cent died, healing or improvement resulted in 81.7 per cent with pneumothorax, 66.6 per cent with phrenic exeresis, and 77.9 per cent with thoracoplasty. No improvement was noted in 10.2 per cent of pneumothorax, 13.7 per cent of phrenic exeresis, and 2.7 per cent of thoracoplasty. He concludes that each of the three procedures has its indications.

Such comparisons as to the value of these three procedures we believe to be of very little importance.

H Fechter, *Ztschr f Tuberk*, 58 385, 1930, observed that new foci on the contralateral side during pneumothorax treatment may appear very suddenly after a period of rest or improvement. He feels that the commonest source of such infection is hematogenous. He concludes that the treatment of the contralateral infiltration under such circumstances is immediate pneumothorax. The duration of collapse treatment may be markedly shortened if this is done at once.

L Kogan, *Ztschr f Tuberk*, 57 173, 1930, discusses the ambulant treatment of tuberculosis by means of artificial pneumothorax and believes the results so obtained are as good as those with sanatorium treatment. He recommends it especially in communities where social conditions are poorly organized to deal with cases in any other manner.

O Neuburger, *Ztschr f Tuberk*, 57 232, 1930, reports 122 cases of pneumothorax during the period of 1925-1929 in which especially good results were attained. Among 90.7 per cent with open tuberculosis 41.9 per cent were free from bacilli following pneumothorax treatment. Following an average sanatorium stay of 4.7 months, 80.2 per cent were discharged as able to work as compared to 59.8 per cent without pneumothorax. After 1-5 years 61.6 per cent of the pneumothorax patients were still able to work.

W Sachs, *Beitr z Klin d Tuberk*, 74 284, 1930, basing his opinion on results in 107 cases

of phrenic exeresis believes that this procedure has a very definite place in the treatment of pulmonary tuberculosis. He warns, however, that its effect in eliminating bacilli from the sputum and in closing cavities must not be overvalued.

M Ardizzone, *Tubercolosi*, 23 389 (Nov) 1931, gives the following indications for phrenicectomy, ulcerative and infiltrative lesions in the bases, basilar bronchiectasis, basal abscess of the lung, fistulous empyema and cases in which artificial pneumothorax could not be done. It is sometimes of great help in lesions around the hilum and in the middle lobe. He feels that in bilateral lesions the operation may be used with more freedom than artificial pneumothorax.

H Els, *Centralbl Chr*, 57 2228, 1930, verifying experiments on monkeys that indicated the lack of danger in combined phrenic exeresis and scalenotomy at one operation, found that a drop of the first and second ribs and a decided decrease in the upper pulmonary areas occurred. The results in 12 cases were better than those in simple phrenic exeresis. He feels that phrenic exeresis should be reinforced by scalenotomy in upper lobe processes when pneumothorax is not indicated or is impossible, when pneumothorax exists with string-like adhesions and cavities, or with large adhesions, when there is insufficient shrinking of the upper pulmonary region, and finally even when thoracoplasty has been done.

We believe that it is only in very rare instances that this operation is necessary or advisable.

Kochs, Els, and Junkersdorf, *Beitr z Klin d Tuberk*, 75 772, 1930, found the vital capacity diminished further upon combined phrenic exeresis and scalenotomy. Cases suitable for operation are those in which there is disease of the upper lung portions. Contraindications for the operation are the same as those for simple exeresis.

W Sachs, *Beitr z Klin d Tuberk*, 74 204, 1930, discusses the open and closed method of pneumolysis. The author does not agree with Sauerbruch that adhesions can be severed better surgically with the open method after thoracotomy.

He is in accord with the vast majority of authorities on this subject.

G Maurer, *Beitr z Klin d Tuberk*, 76 9, 1930, discusses closed pneumolysis. He feels that serous exudates or empyemata are not always contraindications to this operation. Two hundred and fifty-three of his 450 cases were freed from bacilli in the sputum within 44 months. He found that in order to sever an adhesion the size of the transverse section is

not so important as the composition of the adhesion itself. The anatomical relation of the adhesions to the various large blood vessels is an important consideration. Of 160 cautery operations there were only two complicated with empyema. The mortality was nil.

A Heymer, *Ztschr f Tuberk*, 59 37, 1930, reports 200 cauterizations of adhesions resulting in good collapse in 51.9 per cent of cases. In all his cases there was not one with dangerous intrathoracic hemorrhage.

H Ulrici, *Klin Wchnschr*, 11 643 (April 9) 1932, presents the final results of the various methods used in collapse therapy. His results are based on whether or not the sputum became negative. According to this criterion the satisfactory results of unilateral pneumothorax have increased in the author's hands from 18 per cent in 1918-1921 to 47 per cent in 1926-1928. Of 72 patients who were treated with bilateral pneumothorax 36 per cent were rendered bacilli free, while phrenicectomy as an independent operation produced the same results in 18 per cent. Following thoracoplasty 38.5 per cent of the patients lost their bacilli. He concludes that collapse treatment will produce a permanent cure in about 25 per cent of patients with open pulmonary tuberculosis. About 20 per cent are restored to complete working capacity. He adds that the results of collapse therapy will be improved by earlier diagnosis and operation and by more prolonged treatment.

H Lilienthal, *Am J Surg*, 45 356 (Oct) 1931, gives the following procedures that should be employed by the thoracic surgeon to obtain rest or removal of diseased parts, (1) interruption of phrenic innervation, (2) artificial pneumothorax, (3) thoracoplasty, (4) apical extra pleural compression, (5) direct drainage, and (6) pneumonectomy. Contraindications for surgical procedures in tuberculous patients are as follows: (1) the contralateral lung is badly destroyed, (2) the other essential organs of the body are broken down beyond repair, (3) progressive cerebral lesions, (4) advancing cardiovascular disease, (5) progressive nephritis and (6) inoperable neoplasms.

Lilienthal's ideas as to contraindications appear to us to be somewhat naïve. It is only the first that is of fundamental importance.

W Hebenstreit, *Deutschr Med Wchnschr*, 57 1489 (Aug 28) 1931, discussing the combined treatment of artificial pneumothorax and phrenicectomy finds that phrenicectomy does not shorten the period of treatment. He feels that phrenicectomy should be employed only when pneumothorax treatment is unsuccessful.

F B Trudeau, *J A M A*, 98 309 (Jan 23) 1932, finds that phrenicectomy has earned for itself a definite place in phthisiotherapy. The

indications for its use are found largely in unilateral cases, in patients who do not respond well after several months of usual bed-rest treatment, or who have persistent open cavities with positive sputum, or constant cough and expectoration as prominent symptoms. He adds that it is further indicated as a safeguard for those who cannot or will not receive proper treatment after leaving the sanatorium, also in the great majority of cases in which pneumothorax has been tried without success, as well as an adjunct for many pneumothorax cases, also either preceding or following thoracoplasty.

We are firmly of the opinion that it is only in very rare cases that phrenicectomy should be done before trying pneumothorax.

E H Rubin, *Amer Rev Tuberc* 26 516 (Nov) 1932, points out that the medical treatment of elderly patients with pulmonary tuberculosis is along somewhat different lines than are generally followed in the treatment of young adults. There is greater need for medicinal treatment and there is less need for open air treatment. Rest is necessary only as it affects the circulatory rather than the respiratory system. He doubts whether rest, per se causes an increase in the healing of the disease in an elderly individual with fibroid or even fibrocaseous pulmonary tuberculosis who has had the condition for many years.

This is eminently sound and sane advice.

J Head, O Schlack & J Marx, *Amer Rev Tuberc*, 26 653 (Dec) 1932, outline a programme for collapse therapy. According to this, every case of unilateral pulmonary tuberculosis should have either a blocking or extraction of the phrenic nerve. The patient is then treated with bed-rest as seems indicated. If the improvement is not satisfactory, artificial pneumothorax should then be started. If this is impossible or unsatisfactory further bed-rest is prescribed and eventually thoracoplasty. In some instances in which there is extensive early involvement of the better lung, the phrenic nerve is extracted on the worse side and pneumothorax started immediately on the opposite side. In any case in which the sound lung becomes more than minimally involved, pneumothorax is started on this side. They emphasize that this programme is elastic and is still in the experimental stage. They add that collapse therapy should be applied much earlier and much more frequently than is now generally the practice.

This program is distinctly on the radical side.

E H Bruns & J Casper, *Amer Rev Tuberc*, 26 665 (Dec) 1932, call attention to the fact that unless a thoracoplasty completely obliterates a cavity it has failed in its purpose and the patient, even though improved, may continue to

have symptoms of tuberculosis and to be subject to hemorrhage, and further activities of the disease. They recommend unroofing of cavities or a combination of posterior thoracoplasty with pneumolysis to insure the complete closure of cavities.

This likewise is on the radical side.

T Phleninger, *Beitr z Klin d Tuberk*, 80 291 (Aug) 1932, advises that the treatment of hilum cavities should be first by means of phrenicectomy, and followed by pneumothorax only if necessary. He points out that cavities near the hilum are not much influenced by artificial pneumothorax treatment alone because the larger bronchi prevent a collapse and likewise because of the tension of the diaphragm.

E Hager and F Langebeckmann, *Beitr z Klin d Tuberk*, 80 419 (Aug) 1932, take up the question of shifting of the mediastinum in artificial pneumothorax treatment. They find that a marked mediastinal shift may decrease the vital capacity out of proportion to the inflated air. The diagnosis of a shifted mediastinum is made most easily by fluoroscopic examination. On roentgen films the condition may be obscured because the films are usually taken in maximal inspiration and in this position the shift may be less evident than in expiration.

H C Ballou, *Am J Surg*, 16 1 (April) 1932, gives the following indications for oleothorax, (1) as an aid to an ineffective pneumothorax, (2) in cases of purulent and non-purulent tuberculous pleurisy, (3) stabilization of the mediastinum preparatory to or as an adjustment to thoracoplasty, (4) substitute for pneumothorax for economic reasons, (5) treatment of bronchiectasis for purposes of compression, (6) some cases of spontaneous pneumothorax, (7) some cases of small bronchopleural fistula, (8) presence of recurrent serous effusions. From his own experience and that of others he believes that oleothorax should be employed for purposes of compression and disinfection only in selected cases when other recognized methods fail.

W Curschmann, *Beitr z Klin Tuberk*, 80 37 (Mar) 1932, points out that success in thoracoplasty is not solely dependent on the length of ribs removed. It is important to remove pieces of proper length according to the individual findings in each case. The resection must always be closely paravertebral, and must always provide sufficient space for the scapula to drop into the costal cage. The writer also emphasizes that if the operation is done in multiple stages the intervals between operations must be brief, not only because of new bone formation, but because pleural scar tissue may prevent proper collapse. He also adds that proper

bandaging of the thorax for eight or ten weeks following the operation is of utmost importance

I D Bronfin & M Chernyk, *Amer Rev Tuberc*, 26 689 (Dec) 1932, give a résumé of the value and limitations of phrenicectomy. Phrenicectomy is chiefly applicable in the treatment of predominantly unilateral lesions with little or no cavitation, when pneumothorax is impossible and when a routine sanatorium régime has not been productive of good results. They found that it has also a wide field of usefulness in bilateral cases with a limited contralateral lesion without definite cavitation. Frequently by its means they were able to convert an unsatisfactory pneumothorax into an effective collapse. Likewise they found it of use in empyema complicating artificial pneumothorax. In chronic lesions with bilateral cavitation, associated emphysema and general debility, even when there is major disease on one side with recent lower-lobe involvement phrenicectomy is generally contraindicated.

BILATERAL PNEUMOTHORAX

H Scholz, *Beitr z Klin d Tuberk*, 74 146, 1930, reports on two years' experience with bilateral collapse treatment in 48 patients. In 13 of the cases the interval between the first and second pneumothorax was considerable while in 28 cases the two were performed simultaneously. Phrenic exeresis was combined with pneumothorax in seven cases. Among the 28 cases treated 25 yielded more or less satisfactory results. He stresses the importance of early treatment of the second side.

J Leitner, *Beitr z Klin d Tuberk*, 73 718, 1930, points out that Forlanini attempted bilateral pneumothorax in 1911 and that in subsequent years it has become increasingly valuable. He reports 16 cases, and urges that it be done early in bilateral disease or in disease with progression on the other side in the presence of unilateral pneumothorax.

W Sachs, and F Hoth, *Beitr z Klin d Tuberk*, 74 191, 1930, have instituted bilateral pneumothorax in 39 cases of which 17 had bilateral cavities, 14 unilateral cavities with disseminated foci or infiltrations on the contralateral side, three bilateral dissemination with widespread disease of the upper pulmonary area, and five unilateral pneumothorax with new focus formation on the contralateral side. They point out that bilateral pneumothorax is contraindicated in old heavy-walled cavities, circulatory disturbances, intestinal tuberculosis, kidney complications, cachexia, and widespread processes throughout both lungs. Of the 39 cases treated 71.8 per cent became free from bacilli and 20.5 per cent from expectoration. Similar processes yielded results in only 11 per cent of the cases without bilateral pneumothorax. They found

that the number of pneumothorax exudates in bilateral pneumothorax were fewer than in unilateral pneumothorax.

A Frisch, *Wien Klin Wchnsch*, 45 470 (April 8) 1932, urges caution in bilateral artificial pneumothorax treatment. The vital capacity should not be below 800-900 cc at any time during the treatment. One should start on the more affected side and the inflations must be small and should not be given on the same day on both sides. It is frequently observed that one side will show faster resorption of air than the other side. So far as complications are concerned he finds that they are the same as in unilateral pneumothorax. He recommends that reexpansion should not be allowed until the patient has been free from bacilli for at least 1½ years.

Harms and Grünewald, *Deutsche Med Wchnsch*, 58 4 (Jan 1) 1932, report 39 patients who have been treated by bilateral compression. Of these four per cent were cured, 43 per cent improved, 25 per cent worse and 28 per cent dead. He adds that such results are not very encouraging although the procedure should be tried whenever it is indicated.

W C Pollock and H P Marvin, *Amer Rev Tuberc*, 26 709 (Dec) 1932, review their results of bilateral pneumothorax therapy in 25 cases. As a result of their experience they feel that advanced bilateral pulmonary tuberculosis may be arrested by bilateral pneumothorax. They have been able to eradicate bilateral cavitation and prevent rapid fatal termination from bronchiogenic spread to the contralateral lung by the selective type of compression applied to the more recently involved lung. They also point out that it makes possible the utilization of surgical collapse once precluded because of extensive bilateral disease.

This question of bilateral pneumothorax is of great interest and importance and urgently deserves more trial and study.

PROGNOSIS

H Jessen, *Beitr z Klin d Tuberk*, 73 710, 1930, discusses the prognosis of pulmonary collapse in 416 cases. There were 269 cases of pneumothorax, 51 of phrenic exeresis and 96 cases of thoracoplasty. With pneumothorax the early cases yielded the best results. When adhesions could be destroyed by the Jacobaeus method, the therapeutic results were better. As to thoracoplasty he finds that the best results are to be obtained when the patient is operated before there is marked toxemia. He does not place any value upon phrenic exeresis as a test operation or as an aid, but on the other hand found that phrenic exeresis alone in patients with small upper-lobe cavities gave favor-

able results in 61.2 per cent of his cases and in 71.4 per cent of processes of the lower and middle lobes

K. Lydttin and R. Linde, *Ztschr f Tuberk*, 56 329, 1930, find that the prognosis of tuberculosis first diagnosed during pregnancy is less favorable than in those cases in which tuberculosis has existed for some time. Collapse therapy in suitable cases is a valuable aid in preventing the progression of the disease.

W. Julhen and A. Wignolle, *Rev d l Tuberc*, 13 12 (Jan) 1930, give their observations of pulmonary tuberculosis after middle age. They found that three facts characterize the course of pulmonary tuberculosis in the age group which was investigated, (1) a generally poor prognosis, (2) a long duration of the illness after the first appearance of symptoms and (3) a preponderance of males. The development of phthisis at ages above forty-five is attributed to a lowering of resistance after many years of intense physical activity and to family worries. They found that thoracoplasty is too grave an operation for the age group above forty-five.

We are not in accord with this last statement.

A. A. Karan, *Amer Rev Tuberc*, 26 571 (Nov) 1932, summarizes his findings in 538 children admitted to Wallum Lake Sanatorium during a period of 10 years. Seventy-seven or about 14 per cent showed parenchymal tuberculous pulmonary infiltrations of the adult type. In the group were 53 females and 24 males. Sixty-nine or 90 per cent of the patients showed tubercle bacilli in the sputum on at least three different occasions. They found that the prognosis was decidedly less favorable in the age group between 12-15 years of age inclusive. Thirty-three out of the entire group of 77 were known to be in close contact with tuberculous members of their families.

CHILDHOOD TYPE OF TUBERCULOSIS

The recognition and general acceptance by the profession of the childhood type of tuberculosis as a definite clinical entity have been a distinct step in advance. We are now done with such terms, cumbersome and indefinite as "hilum," "tracheo-bronchial gland" and "lung-root" tuberculosis to mention only a few. For this we are greatly indebted to H. D. Chadwick recently of Detroit and now Health Commissioner of Massachusetts.

D. S. Brachman, *Amer Rev Tuberc*, 26 89 (July) 1932, outlines the methods of case findings as followed in the city of Detroit. Briefly it consists of tuberculin testing of all children and adolescents and x-raying the reactors. When the x-ray shows evidence of pathological change or is suspicious a complete physical ex-

amination is made including history of symptoms and contact. On the basis of his work in high schools he recommends that all adults particularly those up to the age of 35 should be x-rayed without a preceding tuberculin test and irrespective of whether there are any symptoms or physical signs. He brings out an important point that a negative diagnosis in tuberculosis should not be made without a corroborating negative x-ray.

W. S. Barclay, *Amer Rev Tuberc*, 26 192 (Aug) 1932, made an intensive study of tuberculosis contacts in families living in Western Canada. He summarizes his findings by saying that tuberculosis is as much an infectious disease as any of the acute exanthemata, but that ultimately it has a far more vital effect on the health, finances and efficiency of the State at large. Investigation of contacts reveals a fruitful field and one which must soon become obligatory. To make adequate provision for this work becomes a new challenge to antituberculosis organizations.

H. D. Chadwick, *Am J Roentgenol* 27 46 (Jan) 1932, describes the lesions caused by clinical primary tuberculosis. He finds that it may show, (1) a circumscribed or more diffused infiltration, pneumonic in appearance, varying in extent from a few centimeters in diameter to the involvement of nearly the whole of one lobe of the lung, with or without demonstrable tracheobronchial lymph nodes, (2) a small nodule in the lung with or without visible lymph-node masses in the hilum, (3) circumscribed masses of caseous nodes projecting outward from the mediastinum, (4) masses of calcified tracheobronchial lymph nodes, and no obvious lesion of the lung, and (5) rarely an area of infiltration with rarefied centre due to excavation and usually associated with enlarged uncalcified tracheobronchial lymph nodes. Areas of infiltration of the exudative or productive types associated with calcified pulmonary nodules or tracheobronchial lymph nodes are classified as the adult type of tuberculosis.

C. A. Stewart, *Am J Dis Child*, 93 803 (April) 1932, evaluating different methods for the detection of childhood tuberculosis comes to the following conclusion. With a value of 100 per cent assigned to the Pirquet test as measuring its efficiency in the discovery of childhood tuberculosis, the roentgen examination has a reliable efficiency of 25 per cent and the physical examination only a small fraction of 1 per cent.

Five or ten years ago no one would have agreed with this statement of Stewart's. At present although most of us would not go so far as he does we are more or less in accord with his opinion.

R. S. Stone and E. Wolff *Radiology* 17 940

(Nov) 1931, find that history, symptoms and physical signs furnish insufficient data to establish a diagnosis of tuberculosis in children. A positive tuberculin reaction merely proves that tuberculous infection is present although the degree of reaction may give some indication of the severity of the lesion. Roentgenographic examination however established a positive diagnosis of intrathoracic tuberculosis in 28 per cent more cases than did purely clinical methods. The percentage of positive x-ray findings was much higher in those cases with the largest tuberculin reactions. He concludes that roentgenograms should be made routinely on all children with a positive tuberculin reaction.

D J Dow and W E Lloyd, *Brit M J*, 1 701 (April 16) 1932, feel that in attempting to localize the lesion in children who are shown to be tuberculous by a positive tuberculin reaction, the chest radiogram is not so helpful as might have been supposed. The lesions if in the lymph nodes are invisible unless calcified and the majority of such lesions may be extrathoracic. Non-tuberculous infiltration and fibrosis are more common than tuberculosis from which they cannot be differentiated, with certainty. Therefore, while the chest radiogram in children is of great clinical value, it has these definite limitations, and its interpretation in the tuberculin positive child needs the greatest care.

H Adler, *Beitr z Klin d Tuberk*, 80 22 (May) 1932, studying the x-ray pictures and the history as regards former contact and infection in a group of 460 patients with pulmonary tuberculosis comes to the following conclusion. Massive childhood infection seems to predispose to later endogenous reinfections, but to protect against exogenous superinfections. Mild childhood infections lack both the predisposing and the protecting factors.

LABORATORY METHODS

E Mayer and M Dworski, *Amer Rev Tuberc*, 26 105 (Aug) 1932, point out that ultraviolet light has a direct bactericidal effect on bacteria. Tubercle bacilli fixed by heat and then exposed to the rays, showed definite alterations in shape and irregularities in staining. They also found that a preliminary application of heat sensitizes the bacteria, so that they become more susceptible to the destructive action of the rays than do unheated organisms.

J W Cutler, *Amer Rev Tuberc*, 26 134 (Aug) 1932, reports on the results of a study with the sedimentation test in a group of 131 patients receiving artificial pneumothorax treatment. He concludes that the sedimentation test gives valuable information at a time when x-ray findings are obscured and physical signs and symptoms are obliterated by the collapse. He finds that the sedimentation rate is a sensitive

measure of the activity of the tuberculous process in the compressed lung. The test will not become normal until the tuberculous process is quiescent in both lungs. This test is simple to perform and to interpret, and by its proper utilization the physician can gather much valuable information. He strongly urges its wider use.

J Kaminsky and D L Davidson, *Amer Rev Tuberc*, 26 282 (Sept) 1932, give their results of the sedimentation test in a series of 500 cases. They found no relationship between variations in the number of red cells and the sedimentation speed. They found that a low color index accompanies a rapid sedimentation velocity. They conclude that there is a close relation between the activity of the lesion and the sedimentation rate in pulmonary tuberculosis. The group of patients whose sedimentation graphs were horizontal lines, showed the lowest incidence of positive sputa, cavity formation, pulse and temperature elevations and substandard weight. The group of patients whose sedimentation test graphs were vertical curves showed the highest incidence of objective signs of activity. They feel that the sedimentation test is of considerable value as an indicator of activity. A single determination may be of some help in appraising a case of pulmonary tuberculosis while repeated tests may furnish much additional information as to the progress of the case and serve to estimate effectiveness of treatment.

This whole question of the value of the sedimentation test needs further study. We believe it to be of real help.

DIETETIC TREATMENT

E S Mariette, *Ann Int Med*, 4 793 (Dec) 1931, describes the diet which is being used at Glen Lake Sanatorium. This diet provides about 3000 calories a day and includes half a pint of milk with each meal and at bedtime. It contains 70-100 Gm protein, about 300 Gm carbohydrate, and the balance in fat. Those who are below weight receive an extra half pint of milk morning and afternoon.

M Mecklenburg, *Ztschr f Tuberk*, 57 47, 1930, treated 30 cases for a period of seven months with the Herrmannsdorfer diet. This gave no better results than an ordinary diet.

M G Schroeder, *J State Med* 39 435 (Aug) 1931, feels that there is no special curative diet for tuberculous patients. In most chronic cases a mixed diet, containing plenty of proteins and fats and sufficient salts and vitamins is indicated. He adds that certain special diets, such as Gerson's, Sauerbruch's and Herrmannsdorfer's probably owe their stimulating effect to the removal of table salt. This type of diet is generally useful only in tuberculosis of skin, and bones and joints. The modified Gerson diet

was found in the author's experience to be insufficiently nourishing and to contain too much liquid food

H Starcke, *Beitr z Klin d Tuberk*, 74 61, 1930, used the Herrmannsdorfer-Gerson diet in 11 children and youths with pulmonary and surgical tuberculosis. Cod liver oil without phosphorus was given. In spite of the fact that weight increases were obtained, the diet had no effect upon the course of the disease. The favorable action noted is considered to be the result of psychotherapy. He does not recommend the diet for children and youths.

C Noorden, *Wien Wchnschr*, 45 708 (June 3) 1932, holds that the decrease of sodium chloride in the Gerson diet is undoubtedly the therapeutically active principle of the diet. He finds that the therapeutic action of Gerson's diet is uncertain in pulmonary tuberculosis.

Evidence seems to be accumulating that the Gerson-Sauerbruch diet is not of any special benefit in pulmonary tuberculosis.

SANOCRY SIN TREATMENT

S Christensen, *Tubercle*, 13 49 (Nov) 1931, treated 438 patients suffering from pulmonary tuberculosis with sanocrysin. It is his impression that sanocrysin causes a shortening of the sanatorium treatment period and a rise in the number of persons "fit for work" following such treatment.

F E Koch, *Beitr z Klin d Tuberk*, 73 751, 1930, treated a group of 80 cases of tuberculosis with sanocrysin and compared it with 80 control patients classified into mild, moderate, and severe types. Both groups were treated in identical fashion aside from the use of the sanocrysin. Of the sanocrysin cases 65 improved as against only 29 per cent of the control cases. Tubercle bacilli disappeared in 39 of the 78 sanocrysin cases, while of the controls only seven of the 70 showed similar effects. Likewise pyrexia disappeared more rapidly in the sanocrysin cases, and the sedimentation reaction was favorably influenced more frequently. The best results were obtained in cases that had existed less than a year. In cachectic cases treatment was without benefit.

The evidence at the present time would indicate that sanocrysin, chrysarobin and similar preparations are at least worthy of more study before being entirely discarded as agents for good in tuberculosis.

TUBERCULOSIS AMONG STUDENTS AND NURSES

J Steidl, *Amer Rev Tuberc*, 26 98 (July) 1932, made a study of tuberculosis among medical students at Harvard and comes to the conclusion that much remains to be done in the way of early diagnosis of tuberculosis in medi-

cal students and doctors. He makes a plea that all medical schools should make every effort to diagnose this disease in their students at a time when it is most amenable to treatment. He advises the routine x-ray examination of the chest of all students including the apparently healthy.

J A Myers and M Wulff, *Amer Rev Tuberc*, 26 530 (Nov) 1932, discuss the question of the control of tuberculosis among university students. They feel that a procedure which will ultimately be satisfactory is to apply the tuberculin test to all entering students and to examine by x-ray the chests of those who react positively and to repeat the tests of the negative reactors every six months and to make x-ray films of the chest of those who have become positive. By this method in four years one should have a working knowledge of the tuberculosis situation in any student body.

W B Soper and J L Wilson, *Amer Rev Tuberc*, 26 548 (Nov) 1932, give their experiences of the examinations of 3000 students entering Yale University. They found that pulmonary tuberculosis of manifest degree in young adults is often demonstrable by routine x-ray, while history taking and ordinary physical examination often fail to disclose manifest tuberculous process. They advise routine roentgenograms of the lungs of college and university students. They warn however that the use of these special methods requires an intelligent interpretation of the findings and a wise application of them to the individual student.

E A Leggett, and J A Myers, *Amer Rev Tub*, 26 559 (Nov) 1932, give their findings in the routine examination of high school students. They found that x-ray examination of the chest of children who react positively to the intracutaneous injection of tuberculin show evidence of pulmonary tuberculosis in from 26 to 69 per cent. In groups with a history of known contact with adult pulmonary tuberculosis a higher percentage show evidence of pulmonary tuberculosis. They conclude that tuberculosis surveys in schools are an important aid in the early diagnosis of tuberculosis.

S J Shipman and E A Davis, *Amer Rev Tuberc*, 27 474 (May) 1933, made an extensive study of tuberculosis among nurses in the University of California Hospital. They found that between six and seven per cent of the student nurses developed clinical tuberculosis during training. An additional four per cent have developed the disease since graduation. It is interesting to note that the majority of nurses who failed to react to tuberculin on entrance also failed to react when rechecked. Most of the nurses who developed clinical tuberculosis during training were positive reactors on entrance. They urge that emphasis be placed upon repeated physical examinations and roentgenograms, checking of weight and an attempt to

arouse what one might term a "tuberculosis conscience" among the nurses

PNEUMONOCOONIOSIS

P. Heffernan, *Tubercle*, 13 193 (Feb.) 1932, divides silicosis into simple silicosis and infective, each having a different prognosis. He finds that acute tuberculosis superimposed on silicosis is usually rapidly fatal, while true tuberculo-silicosis, although a much more serious and more disabling condition than simple silicosis is often a chronic fibrotic and comparatively benign form of pulmonary tuberculosis. In simple silicosis the hard pin-point shadows of the primary stage are characteristic. In infective silicosis the picture is more blurred and irregular from the beginning. Root shadows are also more marked in infective than in simple silicosis. He concludes that the exclusion of persons with latent or active tuberculosis or with lungs otherwise infected from the exposed industries and the protection of the persons employed in these industries from infection are essential measures in reducing and finally abolishing pneumonocooniosis and the disability produced thereby.

L. G. Irvine, *Brit. M. J.*, 1 693 (April 16) 1932, recognizes three distinct types of silicosis, (1) simple or uncomplicated silicosis, (2) silicosis of the infective type but without evidence of active tuberculosis, and (3) tuberculosis with silicosis in which a silicotic condition is conjoined with active tuberculosis. He emphasizes again that the grave feature of silicosis is the high potential predisposition to the ultimate development of tuberculosis.

E. H. Kettle, *Brit. M. J.*, 2 281 (Aug. 13) 1932, taking up the relationship of dusts to tuberculosis concludes that silica and asbestos are the only known dusts which have any etiological relationship. Inhaled dusts are dangerous only when they become soluble in the body and act as tissue poisons. He adds that silica is soluble in the tissue fluids, and that its action is chemical and not physical. It is not merely a question of fibrosis as he points out, but the fact that silica combines with protoplasm and converts it into a particularly favorable soil for the growth of the tubercle bacillus.

W. Geilach, *Deutsche Med. Wchnschr.*, 58 283 (Feb. 19) 1932, emphasizes that cavitation in the silicotic lung may develop without tuberculosis. Postmortem examination of six cases of severe silicosis with cavity formation revealed no evidence of tuberculosis in four. The wall of such a cavity is unlike that of a tuberculous cavity. There is no inflammation and no granulation tissue. The cavity results from liquefaction of the fibrotic tissue such as is seen in myomata. Even the formation of silicotic nodules and fibrotic tissue may occur without the presence of the tubercle bacillus.

H. Coleman, *Arch. Path.* 20 909 (Dec.) 1931

reports two cases of asbestosis which came to autopsy. He points out that symptoms of pneumoconiosis may come on years after a short exposure. The marked fibrosis of the pleura, particularly at the diaphragm is characteristic of asbestosis. The most striking feature in the lungs however, are the so called asbestosis bodies. They are present in great numbers in the fibrosed areas of the lungs, in the spleen and in the reticulo-endothelial cells.

Gerbis and Ucko, *Deutsche Med. Wchnschr.*, 58 285 (Feb. 19) 1932, give their observations on 33 employees who were exposed to asbestos dust. They presented the following symptoms, cough, expectoration, paroxysms of dyspnea, loss of appetite and weight, pleuritic pains and languor. The demonstration of asbestos bodies in the sputum is of special diagnostic importance. These bodies give a deep blue reaction with potassium ferrocyanide and diluted hydrochloric acid. They emphasize the fact that there is a marked discrepancy between clinical signs and subjective symptoms and the x-ray picture. Even the most severe cases do not give such impressive x-ray pictures as those seen in silicosis. They add that asbestosis of the lungs may occur without preceding pulmonary tuberculosis.

SPONTANEOUS PNEUMOTHORAX

M. Siebner, *Deutsche Med. Wchnschr.*, 58 252 (Feb. 12) 1932, reports a case of spontaneous pneumothorax which was diagnosed as perforated gastric ulcer. Laparotomy was done, and its true nature was recognized. Patient made an uneventful recovery. Five weeks later the lung was completely reexpanded. No tuberculosis was found.

Bilateral spontaneous pneumothorax in a case of one of us (J. B. H.), first occurring on the right was diagnosed as gall bladder disease and next on the left as angina pectoris. The fact that no clinical tuberculosis is discovered does not warrant the conclusion that tuberculosis is not the fundamental cause of nearly all spontaneous pneumothoraces.

W. R. Oechsli, J. Skillen, *Amer. Rev. Tuberc.*, 27 67 (Jan.) 1933, report a case of spontaneous pneumothorax with acute abdominal symptoms. The outstanding feature of this case is the absence of the one symptom that is usually present in spontaneous pneumothorax, namely, dyspnea, and the presence of symptoms not usually encountered in these cases, that is, abdominal pain, nausea and vomiting. They suggest that this variation from the usual symptom complex is probably explained by the fact that the direction of greatest displacement of viscera was downward, with consequent embarrassment of the diaphragm so that the heart and mediastinum were only moderately displaced.

L. S. T. Burrell, *Tubercle*, 13 433 (July) 1932, believes that rupture of an emphysematous bleb is probably the cause of spontaneous

pneumothorax occurring in apparently healthy persons. In these cases no effusion forms, and complete recovery almost invariably occurs. He finds that it is not common in general emphysema associated with chronic bronchitis but occurs from the rupture of a small bleb with a valvular opening to a bronchiole. Rest in bed and the relief of pressure symptoms are the only measures indicated in treatment. He is of the opinion, however, that pulmonary tuberculosis is the most common cause of spontaneous pneumothorax. It may be an early sign but usually occurs in advanced lesions. Drainage is justified only as a last resort to relieve symptoms when the pneumothorax cavity cannot be closed by reexpansion of the lung or failing this by thoracoplasty.

H Huber, *Wien Klin Wchnschr* 45 991 (Aug 5) 1932 calls attention to the fact that the term spontaneous pneumothorax is a misnomer because disease in the lung, trauma or a sudden increase of intrapleural pressure is necessary to produce the tear in the lung. The etiology of a number of cases remains unknown and is not satisfactorily explained by any of the theories that have been advanced. The male sex, the age period between 30-40 and the right side show a slightly higher incidence. The symptoms are not always characteristic and point sometimes more to abdominal than to pulmonary disease. He finds that the intrapleural pressures bear no relationship to the degree of functional disturbance or to the gravity of symptoms. He feels that there may be a variety of etiological factors as for instance a circumscribed emphysematous bleb, pulmonary scars or blood-clots in a bronchus, which interfere with expiration, or even congenital malformations.

De Léobardv and Pasquet, *Rev d l Tuberc*, 13 375 (April) 1932 report a case of recurrent spontaneous bilateral pneumothorax associated with pneumoconiosis. The patient made a good recovery on two different occasions. They believe that this is the first case of its kind to be reported in the literature.

One of us (J B H) in February, 1933, had a case of marked silicosis in a sand-blast worker with a bilateral spontaneous pneumothorax with almost no symptoms except moderate dyspnea.

B T McMahon, *Am J M Sc*, 183 695 (May) 1932, reports a case of benign bilateral pneumothorax with recovery, the rupture of the second lung taking place before the complete reexpansion of the first. He points out that it is mostly a sequel of progressive pulmonary tuberculosis. He found, however, only 58 per cent of the cases to be of this type.

H Selby, *Lancet*, 1 238 (Jan 30) 1932, also reports a case of recurring spontaneous pneumothorax on the same side. This case was definitely due to pulmonary tuberculosis.

MISCELLANEOUS

J B Hawes 2nd, *N E Jour of Med*, 207 874 (Nov 12) 1932, discussing the heart in tuberculosis concludes that to be successful in tuberculosis work one should treat the patient first his tuberculosis second, and that his heart rarely if ever requires direct treatment.

H P Carvophilis *Wien Klin Wchnschr*, 44 1467 (Nov 20) 1931 discussing the effects of pneumothorax, observed that the toxic symptoms of patients with pulmonary tuberculosis often decrease immediately after the first or second insufflation of air before a suitable collapse is established. He found that in many cases the discrepancy between this symptomatic relief and the incompleteness of the pulmonary collapse is striking. The usual explanations of the therapeutic action of induced pneumothorax are unsatisfactory to an understanding of such occurrence. He explains that in normal respiration the lung is in a continuous state of hyperemia due to the negative pressure this being particularly marked in the inspiratory phase. By diminishing the negative intrapleural pressure, even without establishing a collapse this hyperemia is reduced and therefore, the resorption of toxic products is markedly decreased. He feels that this mechanism is probably the cause of the immediate symptomatic improvement following induced pneumothorax.

J Alexander, *Amer Rev Tuberc*, 26 209 (Sept) 1932, points out that the status of the sanatorium has changed. He feels that the use of surgery in the treatment of pulmonary tuberculosis has increased more rapidly than the supply of properly trained thoracic surgeons. He finds that there is a tendency for some of this surgery to be done by general surgeons, or even by internists whose special training in the proper choice of patients and in the technique of operations may be inadequate. He urges that every group of rural sanatoria should have affiliated with them a geographically central tuberculosis hospital, located either in a non-urban medical centre or in or close to a city, which should serve as a clearing house for them and which should have upon its visiting staff an adequately trained thoracic surgeon and other specialists. This central hospital would retain for treatment those patients requiring the services of its specialists and would transfer to its affiliated rural sanatoria all other patients, including artificial pneumothorax cases and those who had received surgical treatment.

H Koenigsfeld *Schweiz Med Wchnschr*, 62 494 (May 21) 1932, discussing trauma and pulmonary tuberculosis finds that direct reactivation of an endogenous focus as a result of trauma can only be assumed on the grounds of structural alteration of the focus leading to a direct extension of the process locally, or rupture into the blood or lymph stream with subsequent dissemination of tubercle bacilli, proc-

esses which are accompanied almost immediately by manifestations of acute clinical disease. He feels that an existing direct etiological correlation between trauma and developing pulmonary tuberculosis is justifiable only under these conditions.

We do not believe that his point of view is tenable in the slightest.

M Davidson, *Brit J Tuberc*, 26 80 (April) 1932, points out that in marital tuberculosis, if one of the partners has advanced disease the risk of massive doses of tubercle bacilli, and consequent exogenous re-infection in the consort are increased. He emphasizes however that if precautions are observed there does not appear to be more risk to the married partner than to any one else in frequent contact with tuberculous patients.

E W Phillips, *Amer Rev Tuberc*, 27 277, 1933, describes the effects on patients on being moved from low to high altitudes and vice versa. The patients were moved to a sanatorium in the mountains at an altitude of 5300 ft in the summer time, then returned to Phoenix in October. He found that more than one third of men and women alike, when moved from a low to a high altitude, showed a moderate acceleration of the pulse rate. This was not accompanied by any increase in the clinical activity of their disease, it had no unfavorable prognostic import, it

subsided on their return to the lower altitude. The body temperatures of these patients, whether febrile or normal, were not affected by change of climate and altitude. The incidence of pulmonary hemorrhage was almost exactly the same in the higher altitude, as in the lower. Tendency to hemoptysis was not found to contraindicate transfer to the mountains though all patients so transferred were kept unusually quiet during the period of adjustment. On the whole, he feels that the biennial climatic change is quite beneficial to the patients.

E A Underwood, *Brit J Tuberc*, 26 178 (Oct) 1932, reviews the literature on the use of light in the treatment of pulmonary tuberculosis, and the diversity of opinion as to its merits is brought out. While certain competent observers are convinced that they have had good results in selected cases, the dangers of the method, such as reactivation of quiescent disease, the production of hemoptysis, the dissemination of infection, and the production of focal reactions, must always be borne in mind. He points out that the difficulties of treatment by light are chiefly two, (1) the estimation of correct dosage and (2) the selection of the suitable case. He emphasizes that the method should be used in pulmonary cases only as an adjunct to the established methods of treatment, and hence it should find no place outside the residential institution.

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS*

The National Society is a lay organization and is maintained entirely by voluntary subscriptions. Its constituency is nationwide, and donations of any amount are welcome. The Society derives no support from foundations, and it does not solicit funds from members of the medical profession, as it is felt that physicians make their contributions in the form of medical research as well as free service to patients who are not in a position to pay.

The objects of the Society as stated in its By Laws are:

1 To endeavor to ascertain, through study and investigation, any causes, whether direct or indirect, which may result in blindness or impaired vision.

2 To advocate measures which shall lead to the elimination of such causes.

3 To disseminate knowledge concerning all matters pertaining to the care and use of the eyes.

Although it relies on the ophthalmologic profession for its scientific information and definitely recommends that all matters dealing with the eyes should be cared for by ophthalmologists it is not the policy of the National Society for the Prevention of Blind

ness to take a positive stand against optometry. Its literature and information service are, of course, available to optometrists and optical manufacturers just as to other interested persons. The Society is inclined to deplore the exaggerated emphasis sometimes placed on making the public eyeglass conscious. At times, also, it has been disturbed by the confusion which occurs in the public mind because of the existence of agencies established to further the commercial interests of optical concerns when such agencies are masked under an altruistic name, they appear to be working in the public health field on the same basis as the Society. However, it has been found that such organizations, lacking sound policies and principles, are likely to be short lived.

The National Society itself is an outgrowth of a special state-wide committee on prevention of blindness of the New York Association for the Blind, established in 1908 and financed for some years by the Russell Sage Foundation. This committee subsequently became independent, and in 1915, through an additional grant from the Rockefeller Foundation, it merged with the American Association for the Conservation of Vision, forming the National Committee for the Prevention of Blindness. The name was changed to the National Society for the Prevention of Blindness in 1928.

*Excerpts from the Article in the *Archives of Ophthalmology* November 1933 Vol 10 pp 621-630 relating to the National Society for the Prevention of Blindness.

CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F. M. PAINTER, A.B. ASSISTANT EDITOR

CASE 20051

PRESENTATION OF CASE

First admission A forty-two year old Negro porter entered for the first time fifteen years before his final admission.

He had been seen in the Outpatient Urological Clinic and also in the Outpatient Skin Clinic six weeks before admission to the hospital. In the Skin Clinic a post-balanitic condition consisting of dryness and thick scales was found. In the Urological Clinic he gave a history of having been troubled off and on for two years with frequency three times a day and once at night. A smear showed Gram-negative intracellular diplococci. Two obstructions were encountered with a Number 16 bougie. He was given several irrigations. A filiform could not be passed.

During his stay in the wards a perineal section was performed. Sounds up to Number 29 were passed with some difficulty. A Wassermann test was positive. He gave a history of having had a penile lesion about four years before for which he apparently received very little treatment, only liquid medicine. He was discharged at the end of three weeks.

History of interval The patient was apparently in good health until three years before admission, when he was circumcised because of shrinking foreskin. Following this there developed a pale reddish firm ulcerated mass on the glans penis. There was some oozing of clear fluid but no pain. About one year before admission he had many teeth extracted. This interfered with his diet, making it very difficult for him to eat solid foods. Three months before entry he developed a sensation of having a lump in his throat. This produced increased difficulty in swallowing and often choking. At first this occurred only with solid foods but later with fluids. He occasionally had pain in his throat, but no cough or sputum. There was no interference with breathing. During the year before his second entry he lost about forty-five pounds in weight and became somewhat weaker.

Second admission, fifteen years after his previous discharge. He was brought into the Emergency Ward after having fainted and fallen in the street.

Physical examination showed a poorly nourished, emaciated, feeble looking Negro. The skin was loose and dry, with generalized kera-

tos and scaling. The mucous membranes were pale. The teeth were absent. On the left posterior margin of the soft palate was a small erythematous, slightly ulcerated area about half a centimeter in diameter. In the tonsillar fossa and pharynx was a soft brittle caseous substance, greenish-white in color. Several small shotty glands were present in both inguinal regions. There was a firm tender mass 4 by 3 centimeters in the left submaxillary region. The heart was not enlarged. The rhythm was irregular, with occasional extrasystoles. The radials and brachials were tortuous and palpable. The prostate was enlarged, firm and slightly tender. The glans penis was covered with dry grayish pearly crusts. The right side of the glans was ulcerated and indurated. There was a slight ulceration on the lower surface of the left side of the scrotum.

Examination of the urine showed a slight trace of albumin, a specific gravity of 1.010 and large numbers of white blood cells. Examination of the blood showed a red cell count of 3,190,000, a hemoglobin of 45 per cent, a white cell count of 17,950 with 83 per cent polymorphonuclears. The Hinton test was positive, the Wassermann negative. A urethral smear showed occasional white blood cells and epithelial cells and many Gram-positive cocci and bacilli. A phenolsulphonephthalein test showed a 30 per cent excretion in two hours and forty-one minutes.

DIFFERENTIAL DIAGNOSIS

DR. TRACY B. MALLORY. I have asked Dr. Barney to discuss the differential diagnosis on this case.

DR. J. DELLINGER BARNEY. I did not see the case. That is why you asked me to discuss it, I suppose.

I think in view of the history of a lesion on the penis some time before and in the presence of a positive Hinton, in spite of the fact that the Wassermann was negative, one would strongly consider the idea of a luetic lesion. Also one might have to consider the idea of a chronic balanitis with proliferation of the mucosa.

Of course carcinoma comes strongly into the foreground as the probable diagnosis and in addition to carcinoma one would have to consider other conditions. The only one I am familiar with is sarcoma, and I am not particularly familiar with that, but I believe it does occur.

There seems to be no doubt that the man had a generalized infection, that he had tertiary syphilis, and that his condition was not at all good at the time of the second admission.

The fact that he had strictures of the urethra would indicate that he had had trauma to his urethra or infection of the urethra by the gonococcus. Also we know from experience with gonorrhea that the infection must have been of considerable standing because he had

strictures when he was first seen, and we know that strictures do not form for a long time after infection, from three to five years. There is no history of trauma, so I think we can rule it out. There is likely to be a history from the patient of trauma, because it is a very painful thing, with hematuria and a good deal of trouble connected with it that the patient would not be likely to forget.

DR MALLORY The pre-operative diagnosis in the ward was carcinoma of the penis, as Dr Barney has suggested. They probably wanted to be absolutely on the safe side and a biopsy was done. It was reported as a very low grade epidermoid carcinoma of low malignancy.

FURTHER HISTORY

The patient was transferred from the Skin Service to the Urological Service, where his penis was amputated and an internal and external urethrotomy was performed. During the operation the blood pressure was 50/30. The day following operation the temperature was 100°, the pulse 96 and the blood pressure 85/50. That evening he suddenly coughed very forcefully and as he turned over in bed to eat his supper he spat out a large mouthful of blood. This was followed within ten seconds by a projectile emission from the mouth of a kidney-basin full of bright red blood. His breathing became more rapid, and immediately following an inspiratory struggle there was a second emission of a kidney-basin full of blood preceded by a large loose fresh clot. His respirations stopped. He was given artificial respiration and two cubic centimeters of adrenalin intracardially. This produced very little effect. He died twenty-four minutes after the appearance of the first projection of blood.

CLINICAL DISCUSSION

DR MALLORY Have you anything further to add, Dr Barney?

DR BARNEY I do not think any of us could have foreseen what the cause of death was. I do not know what the condition was in his throat, but of course the carcinoma of the penis was not an emergency affair. They are very slowly growing, and various palliative things might have been done, but I do not think they would have averted the disaster that finally overtook him. Possibly the variation of blood pressure caused by the spinal anesthesia caused some stress on the vessel, which otherwise would have got along very well. It seems to me that I should have done just what was done after having established the diagnosis by biopsy.

Not only that, but he had a stricture of the urethra which was causing a good deal of back pressure on the kidneys and that should have been relieved. The only other way of relieving it would be by suprapubic cystotomy, and I

think an amputation is no more complicated than a suprapubic cystotomy would be.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Carcinoma of the penis

Tertiary lues

ANATOMIC DIAGNOSES

Amputation of the penis for epidermoid carcinoma

Gumma of the pharynx

Vincent's angina

Erosion of pharyngeal (?) artery with hemorrhage

Malnutrition

Luetic aortitis

Arteriosclerosis, aortic and coronary

PATHOLOGIC DISCUSSION

DR MALLORY The impression made upon me by the general appearance of the body of this man was one of extraordinary malnutrition. He was a powerful man and at some time or other must have weighed 170 or 180 pounds. At the time of autopsy we estimated his weight as under ninety pounds. The skin was everywhere loose, dry, and scaly, almost the consistency of an alligator's skin. The question came up very strongly in my mind whether starvation might not have been one of the primary causes of his illness.

The actual terminal event that caused his death was the lesion in his pharynx which had been noted but had not received so much attention as the lesion in the penis. An attempt had been made to biopsy the lesion, but the patient's death supervened before the report could be obtained, so that that did not enter into the picture of the ante mortem differential diagnosis. This lesion in the pharynx turned out to be a gumma, a rather large one, with marked superficial necrosis and a superimposed Vincent's angina, the ulceration finally proceeding to the point where a very large branch of the internal carotid artery was eroded into and an immediate fatal hemorrhage occurred.

In retrospect it is fairly obvious that the pharyngeal lesion was of much greater immediate significance than the penile lesion, although I doubt if any form of therapy would have been effective in preventing the termination.

DR CHARLES L SCUDDER May I ask a question? In retrospect might it not have been better judgment to treat the carcinoma of the penis by x-ray? It was squamous cell, the strictures of the urethra were not bothering him and had nothing to do with the terminal condition of course. Would not that have been good judgment? Thus avoiding any anesthesia at all?

DR MALLORY It was not a type of carcinoma

that is sensitive to radiation. The highly differentiated types are insensitive.

DR SCUDDER I did not know that. Thank you.

DR MALLORY I think it is a general attitude of all medical men to consider carcinoma as an emergency. As a general policy every patient on whom a diagnosis of carcinoma can be made or even a serious suspicion of cancer can be raised is advised to have immediate operation usually in a matter of days, unless there is a very obvious surgical contraindication such as extreme dehydration, anemia, et cetera. I wonder if one does not occasionally go far astray. This man had had his cancer for three years. The examination of the inguinal glands was negative even at the time of autopsy, and I do not think there was any probability that it would have metastasized for many months more. Do you not think that is possible, Dr Barney?

DR BARNEY Yes, it is a very slowly growing cancer.

DR MALLORY I think we lean over backward in urging patients with carcinoma to have immediate operation which is often not absolutely necessary.

DR BARNEY Can some one here tell us what might have been done in the way of treatment of the pharyngeal lesion which might have averted the disaster that overtook him?

DR E W KARCHER I remember seeing this man in the ward for Dr Cummings. I made a diagnosis then of unquestioned carcinoma of the penis. I hesitated in making two diagnoses of carcinoma, though it seemed to me that the large lesion on his left pharyngeal wall and fauces with a gray necrotic pellicle over it looked more malignant than gummatous. I remember inquiring afterwards regarding the report on the biopsy from this lesion, and was informed that it was a chronic inflammatory condition. Was that ever proved to be gumma?

DR MALLORY It is extremely suggestive histologically.

DR KARCHER Of course the man was much emaciated and there was not a great deal we could do in the way of treatment at the time. He had some degree of positivity in his blood. We gave iodides and mercury by mouth which seemed justifiable at the time. I do not think that under the circumstances one would be justified in going ahead with a more vigorous treatment in the case of a man in that condition.

DR MALLORY What period of time do you think it might take to clear up a gumma of that size?

DR KARCHER It was three inches or more in diameter. I should say about three months.

I did not know anything about the final outcome of this case. It seems very unusual for a gumma to cause death by hemorrhage.

DR MALLORY I personally do not think we can explain it entirely on the basis of gumma. There was unquestionably a severe Vincent's

infection superimposed, but I think there was an underlying luetic process. The presence of syphilis was proved beyond a doubt by the condition of his aorta.

DR KARCHER As in so many of these cases, it was difficult to get a good look at his throat with the light we had. His resistance was extremely low and he did not make much if any response to mixed treatment. The hemorrhage it seems to me is more against a luetic process than in favor of it. I was in hopes there might be malignancy there. There was no question as to amputation. The case was such that it seemed highly justified from the standpoint of hygiene alone, particularly after the biopsy.

DR MALLORY I will show you the sections on this case.

This first section is the biopsy specimen from his penis. The masses of red staining material are the groups of cornified cells. Probably four fifths or nine tenths of the cells are completely cornified and acidophilic. In other words it is a very high grade of differentiation, a tumor of correspondingly low malignancy.

The second section shows in the center of the field the remnants of a very large blood vessel that has been completely occluded by an organized and slightly recanalized thrombus. In other words there is a very marked endarteritis surrounding this large area of necrosis and fibrosis in which a few giant cells can be found.

The process is evidently a very chronic one and is entirely consistent with syphilis. In addition, on the surface of the lesion was a necrotic area in which fairly numerous Vincent's spirochetes could be found so that I think he probably has a real gumma of the pharynx, and on that area of somewhat diminished resistance a Vincent's infection was superimposed, and it was the ulceration of the Vincent's that finally went through into the blood vessel and caused the hemorrhage.

DR BARNEY That would occur regardless of operation, would it not?

DR MALLORY In all probability yes.

CASE 20052

PRESENTATION OF CASE

DR RICHARD CHUTE This is the case of a wizened old man of ninety-two who came into my office one afternoon last autumn with a history that for several years he had had what would be called prostatic symptoms,—i.e. frequency, urgency, nocturia,—and that recently he had had a certain amount of hematuria from time to time. These symptoms had been much worse in the past few weeks, ending in complete retention about twenty-four hours before the visit. His doctor had catheterized him. According to both the doctor and the patient there had been considerable difficulty. This man was more or less arteriosclerotic, could not stand any pain, and was very restless. The doctor

had considerable trouble in inserting a catheter, so he sent him to me

Examination showed a man of ninety-two who did not look so old. I should say that he looked about eighty. He was pretty wizened but reasonably active. He was very deaf. Examination of the prostate showed that it was moderately enlarged and had a number of hard nodules on it that would be said from the clinical point of view to be undoubtedly carcinoma. The heart sounds were of fair quality. The blood pressure was 120/75. There were some murmurs in the aortic area, but in general the heart was in fair shape. The bladder could be seen and palpated well above the suprapubic region. One interesting fact was the presence of definite moisture around the umbilicus which suggested that he had a patent urachus, and the pressure in the bladder had made a little urine come out there. The pupils reacted to light.

I passed a catheter. That did not seem much trouble to me, but it did to the patient. There was a little grating as it went in, suggesting a stone or carcinoma. I got out eleven ounces of urine, and sent him home, advising that his doctor teach him to catheterize himself or that he have a permanent cystotomy.

They tried that for a few days and had quite a time. The catheter and the old gentleman did not agree at all. They called me up again and he came in here a few days afterward. At that time his general condition was worse really. This catheterization had given him a good deal of trauma.

I think Dr. Kelley tied in the catheter and we tried him on catheter drainage for twenty-four hours, but he pulled it out and jumped around and we could not do anything with him.

The next day we did a cystotomy under local anesthesia. He went back to his room in good condition. That afternoon he got pretty wild. He wanted to pull out the suprapubic tube and from 1:30 to 3:30 he had one-third of a grain of pantopon, one-sixth of morphia and a dram of paraldehyde, which was probably rather too much sedative for a man ninety-two years old.

When I came down in the later afternoon he had been allowed to slip down flat in bed, and I found him comatose and with many tracheal râles, and I thought he was gone. After he had been put up in a high sitting position he brightened up and was very well for another twenty-four hours, but the afternoon of the second day he showed signs of pneumonia and his temperature shot up. He was put in an oxygen tent, but without avail, and he died about twenty-two hours after I operated on him, from what seemed to be clinically a fairly obvious bronchopneumonia.

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DR. J. DELLINGER BARNEY. Occasionally, yes. I think they are rather uncommon.

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Address Massachusetts General Hospital, Boston. Their subject is "Beriberi Secondary to Short-Circuited Small Intestine" Page 251

BURGESS, ALEX. M. A.B., M.D. Harvard University Medical School 1910 Visiting Physician, Rhode Island Hospital Physician-in-Chief, Medical Service, Charles V Chapin Hospital, and Miriam Hospital Chairman, Division of University Health and Assistant Professor of Biology, Brown University Fellow and Governor for Rhode Island, American College of Physicians Visiting Pathologist, Charles V Chapin Hospital Address 454 Angell Street, Providence, R I Associated with him are

BRIGGS, ASA S. A.B., M.D. Harvard University Medical School 1911 Assistant Superintendent, Rhode Island Hospital Address Rhode Island Hospital, Eddy Street, Providence, R I And

BURGESS, ALEX. M. JR. A.B. Brown 1933 At present a medical student in the first year class at Harvard University Medical School Address Vanderbilt Hall, Longwood Avenue, Boston Their subject is "Oxygen Therapy by the Open Box Method." Page 254

BALDWIN, J. F. A.M., M.D. Jefferson Medical College 1874 Formerly Professor of Physiology and of Anatomy, Columbus Medical College, Chancellor and Professor of Surgical Gynecology Ohio Medical University, Professor of Clinical Surgery, Ohio State University Founder of and Surgeon and Chief of Staff, Grant Hospital Consulting Surgeon to Children's Hospital, Consulting Obstetrician to White Cross Hospital, Columbus, Ohio His subject is "Four Synchronous Cancers of the Small Intestine" Page 259 Address 115 South Grant Avenue, Columbus, Ohio

HAWES, JOHN B. 2ND. A.B., M.D. Harvard University Medical School 1903 President, Boston Tuberculosis Association Director, Rutland Cottage Sanatoria Director, Massachusetts Tuberculosis League and National Tuberculosis Association. Address 11 Marlborough Street, Boston. Associated with him is

STONE, MOSES J. M.D. Tufts College Medical School 1921 Assistant Professor in Diseases of the Chest, Boston University Medical School Examiner in the Tuberculosis Clinics of the Boston Health Department Physician at the Chest Clinic of the Massachusetts Memorial Hospitals Assistant in Medicine, Beth Israel Hospital Address 11 Marlborough Street, Boston Their subject is "Progress in Tuberculosis 1932 1933" Page 260

The Massachusetts Medical Society

STATED MEETING OF THE COUNCIL

A STATED meeting of the Council will be held in John Ware Hall, Boston Medical Library, Wednesday, February 7, 1934, at 12 o'clock, noon.

Business

- 1 Reading record of last meeting in abstract.
- 2 Report of Committee of Arrangements for Annual Meeting
- 3 Report of the Treasurer and Auditing Committee
- 4 Report of Committee on Membership and Finance
- 5 Appointment of three delegates and three alternates to the House of Delegates, American Medical Association, from June 1, 1934
- Appointment of delegates to Congress of American Medical Association in Chicago, February 12 and 13, 1934
- Appointment of two delegates each to the annual meetings of the five New England State Medical Societies
- 6 Consideration of draft of revised By-Laws, submitted by the Committee on Revision
- 7 Incidental Business

WALTER L. BURRAGE, M.D.,
Secretary

Brookline, January 31, 1934

MASSACHUSETTS LEGISLATIVE NOTES

S 63 relates to the petition of Dr. Charles G. Miles, a member of the Senate. The bill is designed to secure to physicians payment of fees for attendance upon an employee and also for attendance on a person injured as a result of the operation of a motor vehicle. Hearing on this bill was conducted on January 23, and it appeared to be the wish of some members of the committee that certain changes in the text of the bill should be made. Senator Miles made a strong appeal for the passage of this bill.

H 128 which is designed to require the vaccination of children in Private Schools was before the Committee on Public Health January 23. Dr. Chadwick, Commissioner of Public Health, and Dr. Robey, President of the Massachusetts Medical Society, were the principal speakers in favor of this bill. An attorney and a few others objected to the passage of the bill.

There were only about twenty five persons in attendance at this hearing. Notice was given that a bill will be considered by the committee at a later date which will represent those who are opposed to compulsory vaccination in any form.

world Diphtheria would soon be banished altogether if immunization by toxin-antitoxin or toxoid were extended to include all susceptible children"

THE SERUM TREATMENT OF PNEUMONIA

For several years attention has been concentrated on the possibilities of specific treatment of lobar pneumonia. Some of the difficulties encountered lie in the knowledge that there are several major groups of this disease with a large number of sub-varieties of some of them.

The Massachusetts State Department of Public Health has been especially active in the study of the methods which may be employed to make the latest forms of treatment available for physicians throughout the State, under the supervision of Dr. Roderick Heffron whose office is in Room 546, State House, Boston.

"A Study of Type I Pneumococcal Infections" by W. D. Sutliff, M.D., and Maxwell Finland, M.D., which is an important contribution to the problem involved appears on page 237 of this issue. This study confirms the belief of investigators that the appropriate serum treatment of Type I pneumonia is of great value in limiting the length of illness and the mortality of this type, and should be read by practitioners who may be called to treat lobar pneumonia which is usually more prevalent in winter and spring.

Although the State Department of Public Health has arranged for the distribution of serum for the treatment of pneumonia, through seventeen stations, and also for consultation service, it may be that one hundred per cent of the doctors have not prepared themselves for dealing with the disease, for in a sense this is an emergency which calls for prompt action. The serum provided by the State is polyvalent and applicable for both Type II and Type I, and if the diagnosis is made early and followed by the specific therapy, the results will be more satisfactory in a larger proportion of cases than under any other treatment. Many times the effect of the serum treatment is spectacular, almost equal to that when antitoxin is used in a diphtheria case.

Typing can be done so promptly in any one of the seventeen stations in the State that there need be very little delay, if the doctor will send the sputum for examination.

It is now up to the doctor to adjust himself to the State program. He must know his nearest pneumonia center and act promptly if he suspects the presence of the disease. If he does not already know, he may write to Dr. Heffron for information. We hope that the article by Sutliff and Finland will stimulate interest in the pneumonia problem.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

SUTLIFF, W. D. B.A., M.S., M.D. Cornell University Medical College 1924. Instructor in Medicine, University of Chicago. Formerly Assistant Physician, Thorndike Memorial Laboratory, Boston City Hospital, and Instructor in Medicine, Harvard Medical School. Address: University of Chicago, Chicago, Illinois. Associated with him is

FINLAND, MAXWELL B.S., M.D. Harvard University Medical School 1926. Assistant Physician, Thorndike Memorial Laboratory, Boston City Hospital. Visiting Physician, Pondville Hospital. Francis Weld Peabody Fellow in Medicine, Harvard Medical School. Address: 818 Harrison Avenue, Boston. Their subject is "Type I Pneumococcal Infections with Especial Reference to Specific Serum Treatment" Page 237.

PHANEUF, LOUIS E. Ph.D., Ph.C., Sc.D. (Hon.), M.D. Tufts College Medical School 1913. F.A.C.S. Professor of Gynecology, Tufts College Medical School. Gynecologist and Obstetrician-in-Chief, Carney Hospital and Malden Hospital. Surgeon, Department of Gynecology, New England Medical Center. Consulting Gynecologist—Beth Israel Hospital, Boston, Leonard Morse Hospital, Natick, Henrietta D. Goodall Hospital, Sanford, Maine, Attleboro Hospital, Attleboro, Mass. Consulting Gynecologist and Obstetrician, Fall River General Hospital, St. Anne's Hospital, Fall River, Mass. His subject is "The Cervical Cesarean Section. An Analysis Based on the Study of Five Hundred and Fifteen Personal Operations" Page 245. Address: 270 Commonwealth Avenue, Boston.

URMY, THOMAS V. B.S., M.D. Harvard University Medical School 1926. Assistant in Medicine, Massachusetts General Hospital, Boston. Address: 226 Marlborough Street, Boston. Associated with him is

RAGLE, B. HARRISON A.B., M.D. Harvard University Medical School 1916. Associate Physician, Massachusetts General Hospital, Boston. Address: 226 Marlborough Street, Boston. And

ALLEN, ARTHUR W. A.B., M.D. Johns Hopkins University School of Medicine 1913. F.A.C.S. Associate Surgeon, Massachusetts General Hospital. Instructor in Surgery, Harvard Medical School. Address: 264 Beacon Street, Boston. And

JONES, CHESTER M. A.B., M.D. Harvard University Medical School 1919. Physician, Massachusetts General Hospital, Boston. Assistant Professor in Medicine, Harvard Medical School.

guided continuously by Dr Pilcher, who originated this publication in 1885 and has continued as Editor to the present day. It has always reflected its editor's standards of quality. As the official organ of the American Surgical Association, the New York Surgical Society, and the Philadelphia Academy of Surgery, it has profoundly influenced American surgery. It has inspired a high quality not only in surgical journalism but in surgical practice as well. It has for fifty years steadfastly kept the faith as a true monthly review of surgical science and practice. And for this, medicine owes a debt to this one man.

Among the honors conferred upon Dr Pilcher are President of the New York State Medical Society in 1892 and of the Medical Society of the County of Kings in 1900, Fellow of the American Surgical Association, and its President in 1918. Honorary Fellow of the American College of Surgeons, the Philadelphia Academy of Surgery, the College of Physicians of Philadelphia, the New York Surgical Society, and the Brooklyn Surgical Society, and one time Commander in Chief of the Grand Army of the Republic.—*Excerpts from the bulletin, the Annals of Surgery*

CORRESPONDENCE

A TRIBUTE TO BOSTON AND THE JEWISH RACE

440 Warren Street
Roxbury Mass.,
January 24, 1934

To the Editor

In the January issue of *Modern Medicine* there is a list of M.D.'s published under the title

Thirtythree Men Who Made Medical Progress in 1933. The value of the list may be questionable. Nevertheless, it is the result of a questionnaire submitted to 150 deans of medical schools and editors of medical journals whose judgment and impartiality we have no reason to suspect.

Assuming then that these 33 names are entitled to the honor given to them, as men who made medical progress in 1933, there are two outstanding facts to which I wish to draw your attention.

First, out of these 33 physicians eight or even nine are Bostonians, which means one-fourth of all mentioned.

Secondly ten of these, or about one-third, belong to the Jewish race.

Both as a Bostonian by adoption and as a Jew by birth I am delighted and proud.

Yours truly

M J KONTIKOW, M.D.

THE INCORRECT USE OF "PEDIATRICS"

Worcester, Massachusetts

Editor *New England Journal of Medicine*

How one specialty in medicine doth now tread upon another's heels

Pediatrics (we used to spell it paediatrics in the early years of the Republic) must now include the care of the child before as well as after birth and incidentally, that of the mother before, during and after the function of bearing, else why is the newly endowed professorship in honor of Dr W. L. Richardson (an obstetrician if there ever was one) to be called the William Lambert Richardson Professorship of Pediatrics as stated in capital letters on page 163 of your esteemed and sometimes correct *New England Journal of Medicine*? I pause for a reply.

Very sincerely yours,

SAMUEL B. WOODWARD, M.D.

January 22, 1934

NOTE: The point of our esteemed correspondent is well taken. The word "Obstetrics" should have appeared in the place of "Pediatrics."

HEROIC DOSES OF CALOMEL

Jan. 19, 1934

Editor *The New England Journal of Medicine*

Some years ago I found this report of a case of 'croup' (quite possibly diphtheria) in an old day book belonging to my grandfather, Adoniram Smalley, one time president of the New Hampshire Medical Society. I was much interested in it at the time, because of the recorded dosage of calomel in the case, thinking it no wonder that calomel got a "black eye" years ago. I thought I had lost the paper but tonight I ran across it by accident in an old note book of my own and again the thought came to me that the nearly 90 year old report might be of interest to this generation of physicians because of the heroic treatment in all respects as well as the accumulated dosage of calomel, though of course if the poor kid vomited as often as recorded he undoubtedly got rid of a good deal of the 70 odd grains of calomel administered—it also had a humorous side-light on the ethics of bygone days. As nearly as I can figure it out, it was about 1845 in December that the reported case occurred and in Lyme, New Hampshire.

The child grew up into a vigorous man and died about 10 years ago.

Respectfully,

F. L. SMALLEY, M.D.

Reading, Massachusetts

Pavson Fairfield was attacked December 9th, Friday Evening with croup, the parents having never seen a case thought it a bad cold and nursed him till 3 o'clock P.M. Saturday when his breathing became so laborious that they became alarmed, and I was called in. I found him labouring under much difficulty of breathing and an urgent cough which gave the distinct stridulous crowing sound so with each inspiration I gave him an emetic of Tart. Ant. which vomited him some fifteen times and kept him nauseated till 1 o'clock in the eve-

MISCELLANY

THE REPORT OF THE COLLIS P HUNTINGTON
MEMORIAL HOSPITAL

The report of this hospital for the year ending June 30, 1933, together with that of the laboratories of the Cancer Commission of Harvard University, is an interesting and informative publication. Therein one may find in concise form the problems which confront the student of the measures employed in dealing with cancer.

The number of patients for the year is about the same as the average of the past ten years, and this may mean that the resources of this beneficent institution are taxed to their capacity. The list of 302 communications published by the staff covers the complicated problems of the management of this disease.

As is the case with many hospitals, the financial resources for the organization have been inadequate as is shown by a deficit for the year of \$26,927.76. This is disconcerting because the study and treatment of cancer constitute major problems before the medical profession and society at large. Such agencies should, even in these times of depression, be generously supported. While it is probable that the campaign for funds now in progress in Boston may supply some relief of the financial burden of the Huntington Hospital, there are so many demands which will have to be considered in the allocation of funds that the solicitors may properly emphasize the needs of this agency for the relief and control of one of the most menacing afflictions of humanity.

EXCERPT FROM THE PRESIDENTIAL ADDRESS
BY SIR HENRY BRACKENBURY TO THE SEC-
TION OF PREVENTIVE MEDICINE AT THE
CONGRESS OF THE ROYAL SANTARY INSTI-
TUTE AT BLACKPOOL, JUNE 1933*

First I want to put before you not as a text but as a reminder, two passages from the Memorandum of Evidence submitted on behalf of the British Medical Association to the Royal Commission on National Health Insurance. The first is this: "The measure of success which has attended the experiment of providing medical benefit under the National Health Insurance Acts system has been sufficient to justify the profession in uniting to ensure the continuance and improvement of an insurance system." The second is this: "The organisation of a National Health Insurance scheme is not necessarily, or even probably, the best means of utilising limited resources for the promotion of national health. It is more than likely that there are a number of other directions in which, severally or collectively a corresponding expenditure would produce an even more satisfactory return." Those statements were made more than eight years ago. There can be no doubt,

however, that contradictory as some may think they appear to be, they are both regarded as true by the great majority of the medical profession today.

A BRIEF RECORD OF DR L S PILCHER

When a surgical journal becomes fifty years of age it is interesting. When one editor holds the reins on one journal for that long, it is news.

FIFTY YEARS—GOLDEN JUBILEE

Dr Pilcher—Annals Of Surgery

The quality of uniqueness is not concealed. It is patent and obvious. When Lewis Stephen Pilcher entered the University of Michigan at the age of thirteen and took his bachelor's degree at seventeen, he did the unique thing. He still stands today, at the age of eighty-nine, the youngest matriculant and the youngest graduate of that institution. His master's degree was added within a year, and in that same year he entered upon medical study. This was in 1863 when the Civil War was raging. The next year found him with enough medical knowledge to volunteer as a hospital steward and throw himself into the thick of service to the sick and wounded. This was the beginning of his medical experience—seventy years ago.

Then back to the University of Michigan and the doctor's degree in 1866. Many years later, 1890, this same institution conferred upon him the further honorary degree of Doctor of Laws. Practice began in a rural district of Michigan at the age of twenty at the same time, to guarantee a livelihood, teaching in the little schoolhouse by the blacksmith shop. He rode his horse across the countryside to the call of the sick, followed the current literature of medicine and for diversion read the classics in their original Greek and Latin.

However the details of practice were not enough. Already he had out his lines for wider fields. The next move was to an internship in a Detroit hospital. Then a postgraduate course in the hospitals of New York City. And then came the successful examination and appointment as Assistant Surgeon in the United States Navy, in 1867. He got experience with practice and with people, and read voraciously. In 1869, yellow fever broke out on the wooden sailing frigate *Saratoga*, in Havana harbor. The surgeon of the ship was one of the first to die of the disease. Upon his death, the young Assistant Surgeon Pilcher was sent to the stricken vessel. With her infected crew she started for northern waters. By the time she reached New York and was relieved, thirty-seven cases of the disease had developed, seventeen of whom died. Then Assistant Surgeon Pilcher came down with yellow fever and was removed to the Naval Hospital at Brooklyn. His recovery, and retirement from the Navy, and entrance into private practice, in 1872, followed.

The *Annals of Surgery* was the first surgical journal in the English language. It has been

*Reported in full in the *British Medical Journal*

from 1908 to 1913 Many graduates of Harvard College remember his interesting lectures on physiology

From 1897 to the time of his death he served the Cambridge Hospital. His first appointment was that of Physician to Out patients in 1897 In 1900 he became Visiting Physician After his service as Major in the United States Army Medical Corps during the World War, with that surgical experience, he returned to the Cambridge Hospital as Visiting Surgeon. The Superintendent of the Hospital says that for many years he was one of her best teachers of nurses

Dr Darling was one of the organizers of the Cambridge Tuberculosis and Health Association and served as its President from 1904 to 1925 During those years of his leadership, he had the pleasure of watching this Association grow until it occupied the position of one of the most important health organizations in the City

His medical affiliations were with the Massachusetts Medical Society, The American Medical Association, The National Association for the Study and Prevention of Tuberculosis The Association of American Pathologists and Bacteriologists The American Association for the Advancement of Science and the Cambridge Medical Improvement Society He was a Fellow of the American College of Surgeons

He was also a member of the Harvard Club of Boston The Faculty Club The Economy Club, The Cambridge Club, the Oakley Country Club and the Wyman Club, whose membership is made up of many of the leading physicians of Cambridge This Club Dr Darling himself founded.

Dr Darling is survived by his widow four children and eight grandchildren. The children are Mrs Maurice E Day of Damariscotta, Maine, Mrs Donald Holbrook of Newton E Merrill Darling of Wellesley and Robert M. Darling of Kingston.

The above list of activities indicates Dr Darling's breadth of interest and his devotion to teaching His chief characteristics were thoroughness, devotion to his friends and real love of the practice of medicine When an important discovery appeared upon the medical horizon, such as bacteriology he was one of the first of the Cambridge physicians to study and understand it thoroughly When a colleague was sick he was eager to aid and always he was devoted to his patients He had in his practice a large following of Cambridge people who already find that they miss him deeply Surely this is the story of a well rounded and useful life

H. F. D

NOTICES

MASSACHUSETTS GENERAL HOSPITAL

Invitations have been issued by the Trustees of the Massachusetts General Hospital for the graduation exercises of the Training School for Nurses to be held Friday evening February 9 at 8 30 o'clock in the Voseley Memorial Building on Fruit Street. An address will be given by Hans Zinsser M.D.

S.D. Professor of Bacteriology and Immunology, Harvard Medical School.

A reception will be held from 9 30 to 11 00 P.M.

LAWRENCE CANCER CLINIC

Lawrence, Massachusetts

January 25, 1934

To the Physicians of the North Half of Essex County

The regular Lawrence Cancer Clinic to be held at Lawrence General Hospital, 1 Garden Street, Lawrence, upon Tuesday, February 6, at 10 A.M., will be a Demonstration Clinic with Channing C. Simmons, M.D., of Boston, Associate in Surgery at Harvard University Medical School, Acting Surgeon in Chief to Collis P. Huntington Memorial Hospital Boston, and Member of Cancer Commission of Harvard University present as consultant. You are invited to accompany any of your patients whom you desire shall have this service or to send them with a note, and a report will be returned to you. This service is gratis. Your attendance at the Clinic is always welcome.

Committee

ROY V. BAKETEL, M.D.

CHAS. J. BURGESS, M.D.,

FRED K. D. MCALISTER, M.D.

JOHN J. MCARDLE, M.D.,

HARRY H. NEVERS, M.D.

THOS. V. UNICAC, M.D.,

J. FORREST BURNHAM, M.D.,

Chairman

This Clinic has the endorsement of the Committee on Postgraduate Instruction of the Massachusetts Medical Society

REMOVAL

HELMUTH ULRICH, M.D. announces the removal of his office to 99 Bay State Road, Boston

RADIO HEALTH MESSAGES

FEBRUARY-MARCH, 1934

Sponsorship: Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health

Courtesy WBZ. Fridays 4 30 P.M.
February

2 What a Parent Should Know About Measles

9 Milk

16 Stomach Trouble

23 Lumps in the Neck

March

2 Age and Cancer

9 Some Problems of Epilepsy

16 Fractures

23 How to Keep the Well Child Well

30 Résumé of the Year's Work

ning at which time I found his breathing somewhat relieved I then left him seven 3 gr doses of Calomel with directions to give them once in 2 hours or oftener if the breathing became worse. Saw him again Sabbath morning. He had taken all the Calomel and had but one slight evacuation from the bowels, his breathing was easy but when he coughed the same croupy sound accompanied it. I then gave him 10 grs Calomel which moved once in two hours. At eleven o'clock A.M. his breathing became more difficult. At 3 o'clock P.M. his breathing became extremely difficult, the head thrown back, the lips purple and every appearance of approaching suffocation. I directed sponges wrung out of hot water and applied to the trachea and the heat increased till it was difficult to apply them in consequence of the pain it produced to the hand because the heat was so great, during this time the snuff plaster was kept on the superior part of the chest, and he was taking once an hour a powder of Cal 1 gr, Ipecac 2 gr, Jones Powder 1 gr and once in two or three hours he had the hot vapor bath by throwing a flannel blanket over his head. I followed this course till 4 o'clock Monday morning when the sponges were laid aside and the snuff or tobacco was applied to the Trachea. At this time the breathing became somewhat relieved so much so that he had short intervals of breathing without the croupy sound with his inspirations. At 10 o'clock expecting a recurrence of aggravated symptoms for the afternoon and evening I suggested the propriety of having counsel when at 2 o'clock Drs Hamilton and Dickey were called in, and after an examination of the case, we retired to a separate room for private consultation, and after a few remarks my able counsellors got into a personal altercation and conferred all their bitter drugs upon each other and left my poor suffering patient to the care of good nursing and my feeble ability. After their ire had been expended in invectives on each other they finally condescended to advise to the addition of 1/6 gr opii to the powder which I was giving and left. They had so far departed from the rules of good order that I did not feel myself bound to heed their advice. Consequently I continued my course of treatment, advised the powders of Cal Ipecac and the use of snuff together with the hot vapour bath. When about midnight my little patient began to improve in breathing, he expectorated a white shining fluid which resembled fibrin. He had vomited at every powder he had taken Tuesday morning at 7 o'clock he appeared much relieved. I then ordered the powders given once in four hours and as often a half teaspoonful of syrup of Squill. He continued to expectorate throughout the day and night. His sputum was thrown up not by cough, but by a peculiar contraction of the muscles of the larynx and glottis, something like the gagging accompanying the introduction of the finger into the throat. Tuesday evening found him sleeping quietly without any of the croupy sound accompanying his inspirations, continued the Squill Syrup through the

night, gave him Ol Ricini, etc. Wednesday morning found him almost entirely relieved except some cough which he had been troubled with since he had Pertussis in July & August."

RECENT DEATHS

O'BRIEN—CARL ROBERT O'BRIEN, M.D., of Bangor, Maine, a member of the Massachusetts Medical Society, died January 9, 1934. Dr O'Brien was born in Boston, Massachusetts. He graduated in medicine from the Tufts College Medical School, and was especially devoted to the study of diseases of the heart and lungs.

He was prominent in local and state affairs. During the World War he served as captain in the Medical Corps. He is survived by his widow, two sisters, who are living in Cambridge, Massachusetts, and a nephew, of New York City.

ROTHFUCHS — CHARLES CHRISTIAN ROTHFUCHS, M.D., of 20 March Avenue, West Roxbury, Mass., died January 24, 1934. He was born in Boston in 1873 and graduated in Medicine from the Harvard Medical School in 1896. He held membership in the Massachusetts Medical Society from 1898 until 1905.

He was active in Masonry.

He is survived by his widow and three sons.

OBITUARY

EUGENE ABRAHAM DARLING, A.B., M.D., F.A.C.S.
April 17, 1868—January 9, 1934

In the sudden death of Eugene A. Darling, Cambridge lost one of its most useful citizens. Coming to Harvard College in the eighties, he stayed in Cambridge and aided in the development of that City during the last forty years. He was fortunate in being able to lead a full happy and useful life up to the very end. He brought up a fine family and saw them all happily established, with children of their own and he died suddenly in the evening after making a professional call.

Dr Darling was the son of Henry H. and Caroline Cady (Martin) Darling and was born in Troy, New York, on April 17, 1868. After graduating from the Troy High School, he came to Harvard College, joining the Class of 1890. With this class he has been closely associated and at the time of his death was Class Treasurer.

His medical education was received at the Harvard Medical School and in the Edinburgh University Scotland.

On February 17, 1892, Dr Darling married Albenia Merrill, of Cambridge.

In 1894, shortly after he began practice in Cambridge, he became an Assistant Professor of Bacteriology in the Harvard Medical School teaching that subject for five years. In 1899 he joined the Department of Physiology and Hygiene in the College. In this Department he held an Assistant Professorship

from 1908 to 1913 Many graduates of Harvard College remember his interesting lectures on physiology

From 1897 to the time of his death he served the Cambridge Hospital. His first appointment was that of Physician to Out patients in 1897 In 1900 he became Visiting Physician. After his service as Major in the United States Army Medical Corps during the World War, with that surgical experience he returned to the Cambridge Hospital as Visiting Surgeon. The Superintendent of the Hospital says that for many years he was one of her best teachers of nurses

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H F D

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FEBRUARY MARCH, 1934

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- 9 Milk
- 16 Stomach Trouble
- 23 Lumps in the Neck

March

- 2 Age and Cancer
- 9 Some Problems of Epilepsy
- 16 Fractures
- 23 How to Keep the Well Child Well
- 30 Résumé of the Year's Work

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health
Fridays 4 40 P M

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health

Courtesy WEEI. Fridays, 5 00 P M

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston

SPECIAL

From Friday, January 19, the State House Broadcasts were discontinued and in their place were substituted Ten Minute Health Reviews

Sponsored by the Massachusetts Department of Public Health. Assisted by Miss Violette Babcock, Violinist, and Mr G Lambert Roscoe, Pianist and Organist.

Courtesy WEEI. Fridays, 1 15 P M

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health Blended with Classical Music

After hearing this new program we would appreciate your comments

REPORTS AND NOTICES
OF MEETINGS

THE GREATER BOSTON MEDICAL SOCIETY

The Greater Boston Medical Society met in the amphitheatre of the Beth Israel Hospital on Tuesday evening, January 9, 1934 at 8 15 P M Dr Maurice E Barron was chairman of the meeting

Dr Max Balin, the appointed speaker of the evening, was unable to attend due to illness and instead Dr Joseph C Aub, physician in chief at the Huntington Memorial Hospital spoke on 'Malnutrition' Problems arise in both diagnosis and treatment of malnutrition Dr Aub pointed out that we have no accurate yardstick to differentiate the normal and the slightly undernourished patient

The causes of malnutrition are various Besides the group secondary to carcinoma, chronic infection, and gastro-intestinal disease, there is a large group of cases classed as "constitutional thinness" These are largely due to poor food habits acquired in childhood and for which overzealous parents are usually responsible Doctors are sometimes at fault in that various articles are excluded from the diet successively by different physicians until the patient is on a totally inadequate food intake Some patients simply lack interest in food Unlike the European

the average American has apparently lost the "art of eating"

An interesting group of cases of malnutrition is that due to abnormalities in the glands of internal secretion Patients appear undernourished in cases of hyperthyroidism, whether masked or obvious. Malnutrition is a marked feature of Addison's disease and is here due to both asthenia and the inability of the gastro-intestinal tract to handle food properly Undersecretion of the pituitary is another cause of undernourishment Hypophysectomized rats not only cease to grow but show a remarkable loss of appetite as well In Simmonds Disease there is atrophy of the pituitary from cysts, tumors, or other conditions The syndrome includes early senility associated with a low blood sugar One case has been reported secondary to pinealoma, but, as a rule, the condition can be shown to be associated with pathological changes within the pituitary body It is practically impossible to make these patients gain weight Some lesions of the midbrain itself often lead to loss of weight, a fact which may explain the malnutrition found with encephalitis

A primary cause of malnutrition is lack of hunger, a subjective experience depending upon forcible contractions on the part of the empty stomach That the contractions of the stomach are readily influenced by such states as worry, anxiety, anger, etc., has been adequately demonstrated Gastric peristalsis is also impaired by violent exercise After severe exertion, contractions of the stomach are lost for nearly two hours Hence the inadvisability of severe exercise before meals

After a consideration of the effects of low food intake on the general metabolism, Dr Aub discussed the treatment of malnutrition An important obstacle to overcome is the patient's psychological resistance No more than three meals a day are to be advised since in this way it is hoped that the patient's stomach will become 'educated' to large meals Bulky food of low caloric content is contraindicated It is advisable to give food which can be expected to leave the stomach quickly so that the patient will be satisfied by the meal for as short a time as possible

Many patients will complain of indigestion of one food or another The administration of tachy diastase has proved beneficial in the relief of carbohydrate indigestion Indigestion of fatty food often complained of by patients is frequently unfounded The psychological barrier may be broken by the administration of fats in disguised form Patients on a low calcium diet usually show a marked loss of appetite The condition is relieved by the administration of calcium conveniently given in the form of milk Vitamins are apparently important for a good appetite especially vitamins B and G Cowgill has shown that the vitamin requirement rises with increased caloric intake

Dr Aub then discussed experiments on increasing the peristaltic activity of the stomach by the production of a low blood sugar Carlson and Bulatao

showed that hypoglycemia after insulin injection led to increased peristalsis in the stomach. There is evidence that the effect may be both from direct action on the stomach and from indirect action through the central nervous system. Insulin then may be of some value in improving the appetite. It has been suggested that one may increase his own insulin production by a small carbohydrate meal two hours before the regular meal, but this would defeat the purpose of the three-meal plan. Alcohol at meals is theoretically worthless but may be of value psychologically. Smoking is to be discontinued if one desires to gain weight. Water should be taken freely at mealtime because it favors early emptying of the stomach.

In conclusion Dr. Aub pointed out that the best diet is a well rounded one. People who begin to limit foods from their diets are almost certain to get into difficulty. All emotional strain and fatigue should be eliminated in order to ensure a properly functioning gastro-intestinal tract.

After an interesting discussion, the meeting was adjourned.

THE BOSTON SURGICAL SOCIETY

The Boston Surgical Society met in the amphitheater of the Massachusetts General Hospital on Monday morning January 8, 1934, at 9 A.M. The meeting opened with a presentation of surgical cases by Dr. Arthur W. Allen and Dr. Edward D. Churchill. The first case was that of a young woman who had entered the hospital with signs of an appendiceal abscess and a history of diarrhea. The abscess was drained in the usual manner but the patient failed to show the expected improvement. At a second operation the terminal ileum was found to be diseased and was therefore resected. The case proved to be one of "terminal ileitis." Convalescence was complicated by digestion of the skin at the site of the wound, but the patient is now doing well.

The case of a sixteen year old boy was presented who has been in the hospital for some months with repeated attacks of intestinal obstruction lately of a high type. The patient is known to have had tuberculous peritonitis and calcified mesenteric glands are demonstrable by x-ray. His present entry to the hospital followed an attack of peritonitis which was shown to be of appendiceal origin (B. coli were cultured from the peritoneal exudate at the time of operation). Subsequently he has had repeated attacks of intestinal obstruction mechanical in type and relieved by enterostomies. With his last attack, Dr. Churchill elected to free the obstruction at the time of laparotomy and to close the abdomen without enterostomy. The patient is now having a satisfactory convalescence, a few days postoperatively.

Dr. Allen presented a 26 year old Portuguese workman who had been operated upon at another hospital for a gangrenous appendix four months before entry. His convalescence at that time was

marked by a septic temperature for three months. He then went home and failing to improve in the next four weeks he entered the Massachusetts General Hospital. At entry he showed obvious signs of sepsis and a mass was felt in the left lobe of the liver from which pus was aspirated. It was marsupialized and forty eight hours later was drained. At the time of presentation pus had ceased draining from the wound and bile was draining instead.

Dr. Churchill presented the case of a young married woman who developed a sybiotic ulcer of the left anterior chest wall following the drainage of multiple breast abscesses on that side. The large ulcerated area has persisted in spite of vigorous treatment for nearly two years. Excision (including cautery) of the advancing undermined edge has been attempted repeatedly. Transfusions have been given. Sinuses and pus pockets developed in the chest wall and these were drained by rib resection almost exposing the pericardium. Various antiseptics have been tried including a suspension of peroxide of zinc without any marked success. Skin grafts in the relatively clean areas have been promising but suppuration especially around the advancing edges continues to be a problem.

Among other cases presented was that of a young girl with infected herpetic lesions of the upper lip producing visible venous thrombosis of branches of the facial vein extending toward the inner canthus of the left eye and associated with marked chemosis and swelling of the face on that side down to and including some of the neck. The case was complicated by a metastatic soft tissue abscess at the right ankle from which pus was aspirated and *Staphylococcus aureus* cultured. The blood culture was positive for the same organism. Ligation of the angular vein was not deemed advisable and the case was treated locally supportively, with blood transfusion, and with non-specific protein therapy ("Aolan"). The patient was having a satisfactory convalescence.

The remainder of the meeting was devoted to the discussion of various topics of interest by members of the staff at the Massachusetts General Hospital. Dr. Fletcher Colby spoke on "Kidney Lesions in Parathyroid Disease." He emphasized the fact that renal calculus is a symptom of disease rather than a disease entity. Bladder stones are usually due to obstruction and infection. Cystine stones in the kidney are known to be due to a derangement in sulphur metabolism. Derangement of the metabolism of calcium and phosphorus may similarly lead to lithiasis. Calcification in the urinary tract has most commonly occurred in the kidney with calcification of the renal parenchyma in two cases with hyperparathyroidism. As a rule these patients do not show bone changes because they are usually on a high calcium diet. The frequency with which renal stones have been shown to be associated with hyperparathyroidism has led to the opinion that blood calcium and phosphorus studies should be done.

routinely in all cases with calcification within the urinary tract

Dr George Holmes next spoke on "Bone Lesions in Parathyroid Disease." He pointed out that the disease picture is one coming under the general heading of osteomalacia and by means of x-ray films demonstrated the differences between parathyroid disease and other members of the group. The most striking changes are in the skull, where the calvarium is thickened and granular in appearance, the tables are poorly or not at all defined, and there are very characteristic changes about the teeth with a disappearance of the dense white shadow surrounding the root. The remainder of the bones show generalized decalcification with cyst formation or a suggestion of it, though this is not at all an essential part of the picture. Cysts in giant-cell tumors are always in the cancellous portion of bone in parathyroid disease, the cysts occur anywhere in the bone and are usually multiple. Dr Holmes carefully differentiated the condition from Paget's Disease, multiple myeloma, and another form of osteitis fibrosa cystica not due to hyperparathyroidism and affecting usually only one group of bones.

Dr E. D. Churchill briefly discussed "Surgery of the Parathyroids." In tumors of these glands we are still unable to say whether we are dealing with true tumors or mere hyperplasia. After excision, the tumor should be confirmed histologically by frozen section. General anesthesia is preferable especially if the operation is to be long drawn out. He mentioned the various places in which the tumors may be found and emphasized the point that palpation is of no value in locating the lesion. Hemostasis and preservation of the recurrent laryngeal nerves are important features of the operation. In cases of large or multiple parathyroid tumors, partial excision followed later by removal of the remainder at a second operation is recommended especially if there is marked decalcification of the bones.

Dr Arthur W. Allen presented the results of his recent study of cases of massive hemorrhage from peptic ulcer. He found that about one-third of the cases of duodenal ulcer at the Massachusetts General Hospital have bled. Fifteen per cent of the cases have bled massively and three per cent have died from the hemorrhage. All fatal cases had bled before. The average duration of life after bleeding has been sixteen days. Fatal hemorrhage is uncommon in youth and increases with age till it becomes 50 per cent at the age of seventy. The old patient should therefore be operated upon immediately and not be allowed to wait. The operative technic was described.

Dr E. L. Young, Jr., spoke on some observations on immunity in the peritoneal cavity. He has been able to secure a sterile peritonitis by the injection of amniotic concentrate. The height of the reaction coming four to six hours after the injection. This has been done preoperatively in a small series of cases of large bowel surgery and an astonishing reduction in mortality from peritonitis has followed.

The results warrant a continuance of the procedure.

Drs. H. H. Bradshaw and W. F. Hoyt demonstrated the apparatus used in the intratracheal methoxy anesthesia and in the rebreathing CO₂ absorption method. The advantages of these methods in administration of volatile anesthetics were discussed. They are being used more and more at Massachusetts General Hospital.

The next speaker was Dr. Tracy Putnam who discussed "Myelotomy Commissurae — New Treatment for Pain in the Upper Extremity." Dorsal section has long been advocated for the relief of intractable pain but the resulting ataxia forbids use in the extremities. Cordotomy, in which spino-thalamic tracts are cut, has proved effective for pain in the lower segments. The pain level has been found to rise gradually after the operation, however, and the operation has been discouraged. The treatment of pain in the upper extremity by dorsal section would have to be at a level in dangerous proximity to the respiratory fibers. The ideal operation for the relief of pain would be the establishment of a syringomyelia-like condition. Putnam has attempted to do this by section of commissural fibers in five cases with success in some of them.

The program concluded with the demonstration of two new instruments by Drs. E. W. Benedict and J. V. Meigs. The former demonstrated the flexible gastroscope and the latter the colposcope. Together with the use of Lugol's solution on cervix uteri has proved to be of great value in detection of early lesions of that organ.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, February 13, at 8:15 o'clock.

PROGRAM

Presentation of Cases. Dr. C. F. McKhann.
The Mechanism of Salt Deficit in Chronic Nephritis. By Dr. A. M. Butler.
The Specific Treatment of Influenzal Meningitis. By Dr. L. D. Fothergill.
Some Experiments in Iron Metabolism. By Dr. L. K. Diamond.

JOHN HOMANS, M.D., Secretary

HOUSE OFFICERS ASSOCIATION OF THE BOSTON CITY HOSPITAL

MONDAY, FEBRUARY 12, 1934

Subject: Endocrinology

8:00 P.M. Presentation of Cases

8:15 P.M. Dr. Fuller Albright, "A Discussion of the Measuring Sticks Now Available in the Diagnosis, Treatment and Study of Ovarian Disorders."

8 35 P.M. Dr Allan Winter Rowe, "Some Abnormalities of Growth and Development."

8 55 P.M. Dr Robert C Cochrane, "Surgical Consideration"

9 15 P.M. Dr Joseph C Aub, "The Pituitary Glands"

9 35 P.M. Discussion.

This meeting will be held in the Cheever Amphitheatre of the Boston City Hospital.

ROBERT T PHILLIPS, M.D., Secretary

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

February 1—Faulkner Hospital Clinical Meeting Thursday at 5 00 P.M.

February 1—New England Hospital for Women and Children Meeting will be held at 7 30 P.M.

COURSE ON MEDICAL BIBLIOGRAPHY Boston Medical Library 1934

February 6—The Making of Medical Books Dr Henry Viets

February 13—Incunabula James F Ballard

Tuesdays at 8 P.M.

Boston Medical Library 8 The Fenway

February 6—Lawrence Cancer Clinic. See page 281

February 7—Annual dinner of the Tufts College Medical School Alumni Association at the Boston City Club, 6 30 P.M.

February 9—William Harvey Society at the Beth Israel Hospital, at 8 P.M. Speaker Dr George Blumer Yale Medical School. Subject "Bedside Diagnosis"

February 12—House Officers Association of the Boston City Hospital. See page 284

February 13—Harvard Medical Society See page 284

February 14—New England Dermatological Society will meet at 3 P.M. at the Massachusetts General Hospital.

February 14—Greater Boston Medical Society will meet at the Beth Israel Hospital Boston from 8 A.M. to 4 30 P.M.

February 16 and 17—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club Boston. For details write Dr A. G. Engelbach, Massachusetts General Hospital Boston.

March 5 and 6 and 7—The Southeastern Surgical Congress will be held at Nashville Tenn. For information write Dr B T Beasley 1019 Doctors Building Atlanta.

March 9—William Harvey Society at Beth Israel Hospital. Speaker Dr Irving J Walker Clinical Professor of Surgery Harvard Medical School. Subject "Judgment and Conscience in Surgery"

March 12—House Officers Association Boston City Hospital, 8 00 P.M. Speakers Drs A. Warren Stearns Abraham Myerson Subject Forensic Psychiatry

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E R. Loveland Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C Guy Lane 416 Marlboro Street, Boston, for details

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnitz General Secretary Dr H. E. Walther Gloriastrasse 14, Zurich.

September 3 6—American Public Health Association, at Pasadena, California. Dr J D Dunshee, Chairman Local Committee on Arrangements

September 4, 5 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association, 450 Seventh Avenue New York, N Y

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

February 7—Council Meeting Boston

Wednesday, March 7—Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker Dr Frank H. Lahev Boston Subject to be announced. Film Electrocardiogram

Wednesday, April 4—Essex Sanatorium Middleton Clinic 5 P.M. Dinner 7 P.M. Speakers Dr Elliott P Joslin and Dr Howard F Root, Boston Subject Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting, at Salem Hospital, 3 30 P.M.

Tuesday, May 8—Annual Meeting Salem Country Club Forrest Street, Peabody Dinner at 7 Speaker to be announced. Subject to be announced.

RALPH E. STONE M.D. Secretary

221 Cabot Street, Beverly Mass.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield at 11 A.M.

CHARLES MOLINE, M.D. Secretary

Sunderland, Mass.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place in March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D. Secretary

76 Church Street, Winchester Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meetings will be held on January 31 and April 25

T. A. STAMAS, M.D., Secretary

226 Central Street, Lowell, Mass.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

February 20—Meeting at the Metropolitan State Hospital, Waltham, 5 P.M.

NORFOLK DISTRICT MEDICAL SOCIETY

February 27—Hotel Kenmore 8 30 P.M. Dr J H. Shortell Industrial Medicine and Surgery

March 27—Faulkner Hospital, 8 30 P.M. Dr Henry H. Faxon and Dr Edward A. Edwards Symposium on "Varicose Veins" Discussion by Dr E. E. O'Neil

April 17—Hotel Kenmore 8 30 P.M. Special Business Meeting

May—Annual Meeting Time place and program to be announced

FRANK S. CRUICKSHANK, M.D. Secretary

1695 Beacon Street, Brookline Mass.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

February 1—12 noon at Norfolk County Hospital. Stated Meeting Speaker Dr Sara Jordan Subject Stomach Ulcers.

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker Dr Elliott P Joslin. Subject Diabetes

May 3—12 noon at Norfolk County Hospital. Annual Meeting Election of Officers

N. R. PILLSBURY M.D. Secretary

Norfolk County Hospital, South Braintree Mass.

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals.

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program titles and speakers to be announced.

The Medical Profession is cordially invited to attend all of these meetings

JAMES H. MEANS M.D. Vice-President.

GEORGE P. REYNOLDS M.D. Secretary
311 Beacon Street, Boston Mass.

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester Mass.

March 14—Dinner and scientific program at the Memorial Hospital, Worcester Mass.

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C. MILLER, M.D., Secretary

27 Elm Street, Worcester Mass.

BOOK REVIEWS

Histoire des Universités Françaises et Étrangères des Origines à Nos Jours By STEPHEN DIRSAY
Tome 1, Moyen Âge et Renaissance Paris
Auguste Picard, 1933 xii + 372 Pages

This book is a very valuable contribution to the history of both science and medicine. The first volume only has been issued covering the period from the Middle Ages to the Renaissance. Dr. Dirsay takes up in separate chapters each of the universities founded during this period and, in addition, presents valuable comments upon the general growth of knowledge as reflected in the foundations of the university chairs. Carefully documented and with superb illustrations, this book is sure to be one of the great contributions to the subject. One looks forward to the publication of the future volumes.

Light Therapy By FRANK H. KRUSEN Published by Paul B. Hoeber, New York. 186 Pages Price \$3.50

This volume is essentially a summary of the recent literature on light therapy condensed into a compact and readable form. The author has done an excellent piece of work in collecting and correlating a wealth of material. Practically every statement made is supported by a reference to its source as indicated by a number referring to the bibliography at the end of the book.

There are twenty-one chapters covering the physics, physiology, technic, and indications for ultraviolet and infrared light therapy.

Special chapters are devoted to the more important special fields.

The arrangement of these chapters is unique. The author first gives a list of the conditions for which light therapy has been recommended together with the references. He then summarizes and evaluates. His position is conservative and he is careful to distinguish between conditions in which the indications for its use are not warranted or 'not proven'.

Thus contrary to the general opinion, dermatologists excepted, we find that ultraviolet therapy is of comparatively little value in the treatment of skin condition, lupus vulgaris and erysipelas excepted. Its value in the prevention of colds is 'not proven'. It is definitely indicated in all forms of extrapulmonary tuberculosis and in certain selected cases of pulmonary tuberculosis. It is a useful adjunct in the treatment of anemia, and in calcium deficiencies associated with pregnancy.

There are few drugs which have a larger field of usefulness. "On the other hand no thoughtful individual could possibly feel that ultraviolet rays are of value in the enormous number of conditions for which they have been recommended."

Infrared is especially indicated in nephritis, arthritis, certain neurologic conditions, fractures, sprains, etc.

The author emphasizes the fact that heat radiations from so called "infrared generators" has no appreciable penetration, and their value is chiefly as a surface counterirritant. Where greater depth penetration is desired, "luminous heat" from the 500 to 1500 watt electric bulb is to be preferred.

This book will be of especial value to the general practitioner who should know the facts of light therapy in contradistinction to the claims put forth by the manufacturers of equipment. Our profession could use more handbooks of this type.

The Operative Story of Cleft Palate By GEORGE MORRIS DORRANCE. Assisted by ENAYAT SHIRAZI. Published by W. B. Saunders Company Philadelphia and London. 564 Pages Price \$6.50

This book approaches the subject in a unique and, in many respects, interesting manner because its various chapters bring out a wealth of historical data on the numerous operative procedures of cleft palate over a period of years.

This historical approach of the subject has been handled expeditiously by judicious grouping of different operative procedures under a definite classification.

In his description of various methods of operations the author seldom injects his views but makes careful records of many writers on the subject with "great care to obtain historical accuracy." Later, however, in his chapter on 'Conclusions' (Chapter XXIII) he summarizes the entire subject and freely expresses his opinions.

One of the most interesting points brought out in this book, which should receive careful attention by workers in this field of surgery, is the author's contention that in order to place the soft palate in normal or in an approximately normal position so that the resultant velopharyngeal closure will adequately shut off the nasopharynx and enable the patient to speak distinctly, it is necessary, not only to bring the two edges of the cleft together but also to 'push back' the entire part of the tissues so as to obtain a long palate. Having this as his object, he advocates what he calls 'push back operation' which is usually performed in two stages, and he gives a detailed description of this operation with excellent diagrams.

The chapters on anatomy and physiology of normal as well as split palates are very complete and bring out many instructive points. There are interesting tables of statistics showing the frequency of different varieties of cleft palates as compiled by various writers. The book also contains mortality tables showing the number of deaths from cleft palate operations at various ages. Eighty-seven pages are given to bibliography alone which is ample indication of the care and labor which went into the preparation of the book.

The author should be complimented for his accomplishment as this is one of the most carefully written books published in recent years.

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THE DIAGNOSIS, TREATMENT AND IMMEDIATE PROGNOSIS OF CEREBRAL TRAUMA*

An Introductory Study of 1494 Cases

BY DONALD MUNRO, M.D.†

ON April 27, 1933 the *New England Journal of Medicine*¹ published an editorial which stated that "the diagnosis, prognosis and treatment therefore of cranial injury after head trauma are in an unsettled state" (From the context it is evident that "cerebral" not "cranial injury" is meant) Further the editorial goes on to say that "the more modern devices of treatment such as the use of intravenous hypertonic solutions, repeated lumbar puncture, and even subtemporal decompression of the brain are all methods not as yet proved to be either essential or even valuable in the treatment of this condition" Taken by itself such a sweeping condemnation of the present methods of treatment of brain injuries amply justifies critical examination In addition it should not be forgotten that "cranial (cerebral) injury after head trauma" is no longer a problem reserved for solution by the specialist, whether neurologist or neurosurgeon Thanks to the automobile every practising physician is having these cases deposited daily, as it were on his very doorstep, and in the main has learned to care for them very efficiently, partly through personal experience, and partly through the perusal of the mass of literature that has collected on this subject in the past fifteen years This experience has taught him that lumbar puncture judiciously used may be a life saving measure, that hypertonic solutions given intravenously are very often a prompt and efficient method of meeting a grave surgical emergency and that subtemporal decompression used as a panacea in the treatment of "fractured skulls" as advocated in the decade from 1910 to 1920, and even as recently as 1933² kills very much more frequently than it cures If this therapy by lumbar puncture and dehydration is ineffective, and if the diagnosis and prognosis of this condition rest on such a shaky foundation, the physician should be so informed. If this situation does not exist, however, that fact should be made apparent also for this is no academic question The correct answer affects the lives and well-being of many hundreds of people, and the most efficient treatment should be a matter of common knowledge

The quoted editorial is based upon a paper by W R Russell recently published in *Brain*³ Although much of the content is undeniably correct, the paper as a whole is unconvincing, principally because it is based on a series of only 200 cases from which moreover all the cases dying within twenty-four hours of injury have been extracted On such data the author makes assertions regarding the diagnosis and treatment of acute brain injuries that are admittedly at variance with the well-substantiated opinions of experienced surgeons Russell states (1) that "Common contre-coup injury is caused by the brain tearing itself from its covering by the force of its own momentum" (p 577), (2) that "increase of intracranial pressure provides a powerful means of controlling hemorrhage from torn cerebral capillaries and veins" (p 597), and (3) that "Morphia is useful—and can apparently be given without danger" (p 598) Such unsound physiopathologic concepts involving as they do the cause, the progress and the treatment of these injuries can best be discussed under the appropriate headings below

In this and succeeding papers I propose to present data in regard to diagnosis, immediate prognosis and treatment of craniocerebral injury drawn from a four year experience with 1494 patients at the Boston City Hospital This should demonstrate that the diagnosis and treatment of this condition are well understood, that the immediate prognosis is reasonably good and that the modern devices of treatment are both essential and valuable

SUMMARY OF MATERIAL Most of the large series of cases of craniocerebral injury have been studied from a postmortem point of view Clinical studies have been inaccurate and inconclusive because, having in mind the multiplicity of symptoms that result, the number of cases studied has been too few This paper deals with certain aspects of 1494 cases seen and studied by the entire surgical staff of the Boston City Hospital over a period of four and one-half years These cases fall into two groups The first group are those cared for on the general surgical service The second group were treated on the Neurosurgical Service and were under the direct care of the author (Chart 1) The general surgical material consists of 989 cases with a mortality of 17.6 per cent, but

From the Neurosurgical Service, Boston City Hospital
†Major—Visiting Surgeon in charge of neurosurgery Boston City Hospital For record and address of author see "This Week's Issue" page 330

a mortality of 57 per cent if deaths within twenty-four hours are omitted. The rest of the material has an excessive per cent of operated patients. This is because there is a natural gravitation of the more seriously injured toward the special Neurosurgical Service and reserved for later publication. The figures presented below have to do only with the common types of cerebral injury: concussion, congestion and edema, contusion, and laceration. All cases are excluded that left the hospital against the surgeon's advice. In the majority of the fatal

CHART 1

	Total Cases	Total Deaths	Mortality %	Deaths After 24 • Period	Mortality % Without 24 • Deaths
General Surgical Service	989	175	17.6%	50	5.7%
Neuro-Surgical Service	505	79	15.6%	47	9.9%
Boston City Hospital	1494	254	17.0%	97	7.2%

CHART 2

SKULL	{	Linear and/or Comminuted Fracture					
		Depressed Fracture					
		Compound Fracture					
		Special Fractures	{	Involving Para Nasal Sinuses			
Middle and/or External Ear							
Including Pneumoencephalocele							
Cribriform Plate							
				Bullet Wounds			
BRAIN	{	Concussion					
		Edema					
		Contusion and/or Laceration					
		Special	{	Hemorrhage	{	Sub or Extra	} Dural
				Intra ventricular			
					Rupture of Venous Sinus		
				Multiple Petechial			
		Infection	{	Meningitis			
					Cortical Abscess		
SCALP	{	Lacerated and/or Incised Wound					
		Contusion					
		Hematoma					
GENERAL BODILY CONDITIONS	{	Surgical Shock					
		Exhaustion					
		Dehydration					

away from the general surgical side. There are 505 of these cases with a mortality of 15.6 per cent and a mortality, without "twenty-four hour deaths", of 9.9 per cent. From this combined material it has been possible to get significant data in regard to the diagnosis and treatment of compound and depressed fractures, extra- and subdural hemorrhages and other less common types of brain injury. This is being

ties the cause of death was verified through the kindness of the medical examiner's office.

DIAGNOSIS *General Bodily Conditions* Accuracy of diagnosis, based on as firm a pathological foundation as possible, followed by appropriate treatment is the road to success in the treatment of any surgical condition. This first requirement is met by the classification of these skull and brain injuries into groups in accord

ance with chart 2. Of the general bodily conditions I wish particularly to emphasize again the importance of being positive about the presence or absence of surgical shock. This diagnosis is based on a falling pulse pressure, a low temperature, a pale moist skin and a weak rapid pulse. It is essential to recognize this condition because all examinations are contraindicated while it is present and treatment must be limited to measures suitable for the shock alone, regardless of any other evident pathology.

Skull. So far as injury limited to the skull is concerned, compound fracture is diagnosed on entrance to the hospital by palpation through the scalp wound, this method having proved infinitely more accurate than x-ray examination. The diagnosis of other fractures (with one exception) by x-ray or other means is postponed until after convalescence from the brain injury has begun, i.e., during the second or third week. At that time views in the antero-posterior and postero-anterior positions as well as stereoscopic lateral films from both sides are taken. The single exception is when the presence of an extradural hemorrhage is in question. Here the positive visualization of a linear fracture crossing some part of one or both of the middle meningeal arteries may turn the tables in favor of operative interference and is information that is essential. I am convinced that x-ray examinations made except as above are not only useless in a large percentage of cases but are indeed definitely harmful to the patient.

Brain Injuries. Classification of the brain injuries is more complicated and because of this the surgeon must always hold himself ready at any time to revise or completely change his working diagnosis and therefore his treatment. A proper understanding of the chronology of the pathology is essential. Following a blow upon the head strong enough to jar the brain, unconsciousness may be produced. This primary unconsciousness is due to *concussion*, a term that should be scrupulously reserved for this preliminary symptom only. G. Gavin Miller¹⁰ in 1927 produced true concussion experimentally and in addition repeated and corroborated previous experimental work by others. He demonstrates that concussion is an entity by itself, that it is caused only by mechanical means (i.e., a blow on the head), and that it is immediate in onset and tends of itself to spontaneous recovery without sequelae unless severe enough to paralyze respiration. The condition should be sharply differentiated from all brain injuries showing gross lesions such as contusion, multiple petechial hemorrhages, edema and the like. At present concussion is best explained as due to a direct mechanical derangement of the molecules within the nerve cells, causing temporary loss of function. Such a disturbance is quite a different matter from gross cerebral lesions, although in both cases, if his theory be

accepted, the damage is done by the same type of trauma, the molecular field being involved in concussion and the microscopic or macroscopic fields in the other types of injury. Cases suffering only from concussion rarely reach the hospital; indeed I have been able to recognize concussion among hospitalized patients only in young children who have been admitted for observation as a precautionary measure. Objectively and subjectively these patients are normal and have a normal intracranial pressure and cerebrospinal fluid and require no active treatment. If the blow be harder and the injury more severe there will be a more prolonged period of deeper unconsciousness alternating with periods of delirious behavior and succeeded in its turn by absolute flaccid coma, respiratory difficulty, collapse of the circulation and death from respiratory paralysis. This group of symptoms follows immediately after, and may merge with, the unconsciousness due to the concussion. They are caused by gross brain damage, the severity of which, other things being equal, is in general in direct relation to the length and depth of the coma. This damage can be divided into three recognizable groups, (1) edema and congestion, (2) contusion and (3) laceration. Each succeeding group includes as part of its pathology the previous preceding groups as for example edema and contusion are both present in association with a laceration of the brain. They overlap and often the classification must be arbitrary but at operation or autopsy one or the other of these pathological features will predominate. Any of the conditions classed under "rare forms" may be superadded to any one of the fundamental groups. A lacerated contused brain may be in addition subjected to pressure from a subdural hematoma providing a cortical vessel is torn and bleeds into the proper space. Edema and congestion of the brain will be associated with multiple petechial hemorrhages and the same condition may form the background for the changes brought about by the development of an extradural hemorrhage.

Excepting in pure concussion, the primary reaction of the brain to injury is like that of soft tissues anywhere else in the body. There is congestion, edema and a rise in the pressure of the cerebral venous circulation. This is accompanied by a concomitant rise in intracranial pressure.^{11, 12} If this process is continued long enough to produce anoxemia there is tissue damage and more edema.¹³ Clinically it is possible to recognize this *congestion and edema*. The patient has been unconscious, complains of a headache, may have a short period of memory loss in children convulsions and even hemiplegia may be present and altered tendon and abnormal reflexes occur. The intracranial pressure is moderately raised in the majority of cases and the cerebrospinal fluid is clear and

colorless and of normal chemical content. The brain volume is increased but there is no mechanical obstruction to the absorption of cerebrospinal fluid.

In *contusion* the unconsciousness is more prolonged as is the amnesia, the headache more severe, there may be disorientation and mild confusion, and abnormal reflexes are common. There may be a period when surgical shock is present right after the injury. The cerebrospinal fluid is pink or pinkish yellow with increased protein content if there has been any hemolysis of red blood cells. The intracranial pressure is moderately elevated and tends to remain up for two to five days in spite of repeated lumbar drainage. There is not only increased brain volume but also an acute mechanical hydrocephalus. This is due to the blocking of the avenues of absorption in the arachnoid villi by free red blood cells until such times as they are removed by the action of the meningocytes.¹⁴

In *laceration* a state of surgical shock is practically always present, irrationality, confusion and disorientation may be extreme or there may be deep coma with general muscular flaccidity including the sphincters. Respiratory periodicity, a slowed pulse and high pulse pressure, a rise in temperature, stiffness of the neck, fixed dilated pupils (a late sign), a slow return of consciousness with severe headaches and a prolonged amnesic period are usual signs and symptoms. Reflex changes are common and signs of excessive local cortical damage such as aphasia, astereognosis, facial palsy and hemiparesis occur frequently. The intracranial pressure is very high (I have measured as high as 100 mm mercury) and repeated lumbar drainage over a week to ten days will usually be necessary to reduce it to normal levels. The cerebrospinal fluid is at first red or appears almost like pure blood, changing later to dirty yellow and then clear yellow, this latter color often remaining after the increased intracranial pressure has again become fixed within normal limits. The chemical content is as under contusion. There is increased brain volume of only a moderate degree together with a marked mechanical acute hydrocephalus as in contusion. This if untreated may lead later to a mild permanent distention of the ventricles.

The diagnosis of the *extra* and *subdural hemorrhages*, *meningitis* and the rarer types of brain injury must be deferred for later presentation but it can be stated here that their symptoms and signs are superimposed upon those of the fundamental conditions epitomized above and cannot be intelligently evaluated until that fact is appreciated.

Much of this cerebral damage is done by *contre-coup injury*. Attention was directed to this fact by Russell³ as noted above. His explanation of the mechanism however is incor-

rect and cannot be allowed to stand without comment. There can no longer be any question but that the skull in life is practically a closed box and that the small amount of motion allowed the brain inside this box is due to the to and fro movement of the cerebrospinal fluid which in turn is possible only through the so called elastic doors (occipito atlantoid ligaments, etc⁶). LeCount and Apfelbach⁸ and B. M. Vance⁹ have demonstrated that *contre coup* lesions occur only when the patient's head is injured while in motion. In such circumstances the brain lags behind and is most closely applied to the aftercoming portion of the skull. To be sure the skull is flattened at the point of impact and the brain immediately beneath is directly injured by this local application of force. In addition, however, because the axis of the skull is abruptly shortened at right angles to the plane of impact and because the brain is most closely applied to the bone directly opposite the point of impact, the most severe bruising occurs at this place. They further point out that *contre coup* subdural hematoma from torn cortical vessels are one of the most common accompaniments of fractures and that the same lesion due to tearing loose of the tributaries of the large sinuses is relatively rare, a relationship that would not exist if the brain were free to move to any significant extent as postulated by Russell.

TREATMENT In the past and even in the present² the only choice in treatment has been considered by many to lie between the watchful waiting of rest in bed and the opposite extreme of operative interference, usually in the form of a subtemporal decompression. More recently, however, thanks to the work of Weed¹², Foley and Putnam¹⁵ and others with hypertonic and hypotonic solutions intravenously, and saturated solutions by the bowel, in association with a freer use of lumbar drainage checked by manometric readings (Frazier¹⁶, Landon¹⁷, Jackson¹⁸, Fremont-Smith²⁰, Ayer²⁰, Munro²¹) the pendulum has gradually swung away from these earlier methods. In the rush of enthusiasm attending the adoption of new methods many instances of misapplication have cropped up and, as a result, there is a tendency at present to blame the failures on the method, rather than on the operator for his improper use of it.

Therapeutic Dehydration All that any hypertonic solution intravenously, or a saturated solution of magnesium sulphate by the bowel, can do or should be expected to do in this connection, is to reduce the brain volume. The intravenous method will do this more rapidly and for a shorter period of time than the use of the salt by the bowel. Coincidentally if the intracranial pressure be high, it will be reduced by just so much as the brain is shrunk, but on

the other hand no change can or should be expected to take place in the residual increased intracranial pressure that is present because of the acute hydrocephalus brought about by the mechanical blockade of the absorptive channels. Therefore universal treatment of all forms of brain injury by this one type of therapy cannot be justified. Furthermore dehydration may be dangerous if used without accurate measure on its effect. I have unintentionally produced toxicity (with symptoms closely simulating those of acute edema or confusion) both by the use of 50 per cent glucose intravenously and by saturated solution of magnesium sulphate given by rectum. Also those who have used hypertonic salt solution know to their cost what a devastating effect the secondary wave of cerebral edema that follows the therapeutic brain shrinkage may have. When properly limited, however, to cases of edema (where it can be the sole therapeutic agent) or to use as a preliminary emergency treatment in cases of confusion and laceration, both 50 per cent glucose intravenously (repeated once or twice if necessary) and saturated solution of magnesium sulphate by rectum (repeated every three or four hours for four or three doses) will prove of very real value and will often be actually a life-saving measure. The effect of both of these drugs should be checked by manometer readings of the cerebrospinal fluid pressure.

Lumbar Puncture Decompression by lumbar puncture, on the other hand, is suitable for all three types of uncomplicated brain injuries. The edema is relieved because with the reduction of intracranial pressure to normal, the venous congestion is corrected and the reactivated circulation allows the partially damaged asphyxiated cells to recover as much as possible. The excess intracellular and perivascular fluid is then absorbed and the brain volume is thus returned to normal. In contusions and lacerations the excess unabsorbed fluid is mechanically removed together with a small amount of free blood and the meningoocytes, if the drainage be repeated often enough, are aided in the uncorking of the absorptive channels in the arachnoidal villi.^{14, 23} Here, too, venous congestion and intracranial hypertension are reduced just as in the edema group. Rest in bed, like ice to the head, or a quiet dark room, proper nursing, etc., is important but as compared with these other more direct methods, can do little to correct the pathology.

Subtemporal Decompression Subtemporal decompression by its very nature is only efficient in the mild cases in which it is not urgently needed. In the severe cases the decompressive effect is shortly lost because the dural and bony opening is soon tightly plugged by an edematous cortex. This is as effective a cork as though the dura had been left unopened. En-

larging the decompressive opening beyond the limits of the temporal muscle seldom proves efficient, causes great difficulty at the closure and adds future trouble in the form of cortical adhesions.

Arrest of Intracranial Hemorrhage The most pernicious of all teachings relative to the treatment of craniocerebral injury is the misconception that an increase in intracranial pressure will prevent or arrest intracranial hemorrhage associated with such an injury. This erroneous point of view can be most clearly stated by quoting in full from Russell's paper³: "It is important to bear in mind that a degree of increase of intracranial pressure provides a powerful means of controlling hemorrhage from torn capillaries and veins. In this way cerebral edema may prevent hemorrhage and correspondingly the artificial reduction of intracranial pressure may aggravate it." That this assertion is grossly inaccurate and not in accord with the facts has been shown experimentally and is known clinically to all surgeons with any wide degree of experience in traumatic or any other form of intracranial surgery. This fallacy is widespread among the profession and should be done away with as rapidly and as completely as possible.

Experimentally in 1928, H. S. Forbes⁴, working first alone and later in the same year with H. G. Wolff⁵, confirmed the findings that Cushing⁶ published in 1901 and "add further details of a quantitative nature." They demonstrate that following a rise in intracranial pressure there is a slowing of the blood flow in and dilatation of the veins and arteries, the circulation being maintained (without increase in the systemic blood pressure) by a rise in pressure in the cerebral capillaries, arterioles and smaller arteries. Following a further rise in intracranial pressure the cerebral circulation becomes even slower and then begins to fail, as a result of bulbar anemia the systemic arterial pressure then rises reflexly and the cerebral circulation is reestablished. This compensation may occur several times if the intracranial pressure is raised by steps. Such slowing of the capillary circulation (congestion) is equivalent to anoxemia applied to the tissues of the brain generally. Depending upon the degree and the length of time it is present, there is a proportional cellular destruction, petechial softening, edema further stasis and stagnation, and capillary hemorrhage. Small areas of destruction may coalesce into larger areas with further spreading edema and further rise in intracranial pressure. Such a succession of events even in the absence of injury has been reported by Cobb and Hubbard⁷ as a series of cerebral hemorrhages from venous and capillary stasis.

Clinically it is common practice for the surgeon to open a skull and dura in the presence of

increased intracranial pressure and find a congested bleeding cortical vein in the operative field. The surrounding cortex will be bulging, not pulsating and firmly jammed against the edges of the bony opening. All attempts to close the ruptured vein and stop the hemorrhage fail until the bony and dural openings are enlarged to a point where decompression is accomplished, and high intracranial pressure thus reduced to normal. As soon as this is done the cortex no longer bulges, pulsation is again resumed, the cortical veins shrink and lose their congestion, and bleeding from the ruptured vein in question can be easily controlled by a silver clip, a silk tie or even the implantation of a muscle "stamp" graft, the vein if small enough may even close itself.

These observations show that cerebral venous and capillary pressures are approximately equal to intracranial (cerebrospinal fluid) pressure, and that they rise and fall with it. Thus high intracranial pressure cannot cause hemostasis without causing anoxemia and necrosis of the brain. By the same token lowering a high intracranial pressure by lumbar puncture decreases venous bleeding, because the venous pressure falls with the lowering of the cerebrospinal fluid pressure. The venous pressure is high *because* the intracranial pressure is high. Arterial pressure is rarely a factor since it is not affected until the intracranial and cerebral venous pressures approach arterial diastolic pressure, i.e., 900 to 1100 mm. of water. Obviously arterial bleeding can never be checked by increased intracranial pressure, capillary stasis and death would take place long before such an intracranial pressure (1600 to 2000 mm. of water) could act on the arterial stream.²²

The Use of Morphia. Associated with the foregoing in its danger to the patient but more widespread in its effect because of the immediate results obtained is the use of morphia in craniocerebral injuries. Any statement that "morphia is useful and can apparently be given without danger", is most pernicious teaching and cannot be condemned too strongly. Morphia is a dangerous drug and one of its chief actions is to depress respiration. Of these injuries concussion alone often alters and even paralyzes the respiratory center in the medulla. Increased intracranial pressure usually impairs the function of this same mechanism. Since death occurs in many cerebral injuries from respiratory paralysis, it is folly to add the burden of morphin poisoning to an already embarrassed vital respiratory centre. This is not mere theory. Any physician called as consultant to see patients with brain injury has again and again acted as mere spectator to a respiratory death hastened by the injudicious use of morphin. It can be taken as a good general rule "No morphine where increased intracranial pressure is suspected."

Procedures. The fundamental treatment of the 505 neurosurgical cases included herewith has been a combination of therapeutic dehydration and decompression by lumbar drainage. In those cases that are not immediately fatal this treatment is expected to cause a progressive improvement in the patient's signs and symptoms. If this does not occur, and toxic dehydration and meningitis can be ruled out, exploratory temporal trephine is considered indicated. This serves to eliminate the possibility of sub- or extradural hemorrhage or of one of the rarer forms of brain injury. It can be categorically stated that in no case in this series has the medical examiner made a diagnosis of death due to lumbar puncture.

Value of Therapeutic Lumbar Puncture. For the purpose of comparison of mortality rates between this and the more passive forms of treatment I have grouped the cases from the general surgical services into those punctured and those not punctured (Chart 3). The dif-

CHART 3

	Total Cases	Deaths	Mortality %
Treatment by Lumbar Puncture	340	32	9.4%
Treatment without Lumbar Puncture	631	122	19.3%
Total Cases	989	175	17.6%

ference in mortality is quite striking and speaks for itself. These cases were treated by house officers under the direction of the surgical staff and cover a period of four and a half years.

CHART 4

Service	Total Cases	Total Deaths	Mortality %	Cases Treated by Lumbar Puncture %
1st				
1922	65	16	24.6%	23%
1930-33	224	34	15.1%	22%
2nd				
1922	62	17	27.4%	16.1%
1930-33	170	22	12.9%	57.0%
3rd				
1922	94	14	14.8%	68.7%
1930-33	124	24	19.3%	30.0%
4th				
1922	97	14	18.1%	11.6%
1930-33	85	18	21.1%	35.2%
5th				
1930-33	80	11	13.7%	44.8%

This same group when arranged by services and separated into cases treated in 1922 when lumbar puncture was first introduced and those treated in the past three years shows less striking but similar figures (Chart 4). In particu-

lar it is interesting to note the drop in the second service mortality from 27 to 13 per cent while there is an associated rise in the percentage of cases treated by lumbar puncture from 16 to 57 per cent. Conversely on the third service a fall in the percentage of lumbar puncture treated cases from 68 to 30 per cent has been accompanied by a rise in service mortality of from 15 to 19 per cent. The apparently contradictory figures under the fourth service are not representative on account of the small number of cases involved. These facts and the figures tabulated under prognosis demonstrate that the intelligent use of therapeutic dehydration as a supplement to decompression by repeated lumbar puncture drainage is the safest and best method of treating the large majority of brain injuries. Wholesale condemnation of this method must be due either to a lack of experience or a failure to grasp the possibilities and limitations of the therapeutics.

PROGNOSIS While it is possibly true that most brain injury cases that will not survive the first twenty-four hour period without treatment may not survive with treatment, this statement cannot be taken so literally as to imply that intelligent oversight by a surgeon during this time will not save a few lives that would otherwise be lost. The fatalistic attitude recently publicly taken by Dandy² that "20 per cent (of the total number of patients with severe injuries to the head) must be regarded as beyond redemption by any rational means available" and that another 10 per cent can only be saved by a subtemporal decompression pushes the surgical clock back ten years. Such claims can only be explained by the supposition that the clinic from which he writes, but whose figures he does not quote, must have a relatively small number of these cases (Chart 5).

and hence to institute adequate treatment. Only the unavoidable pulmonary and meningeal infections are considered as excusable cause for such deaths. Among those cases on whom I have learned to make an early and fairly accurate diagnosis the mortality drops further. For example. If the unusual middle

CHART 6
NEURO-SURGICAL SERIES

	Living	Dead	Mortality %
Total Cases	505	79	15.6%
Total Cases without Meningeal Hemorrhages	465	61	13.1%
Total Cases without Meningeal Hemorrhages and Compound Fractures	405	42	10.3%

meningeal and subdural hemorrhages are eliminated from this series the rate is only 13.1 per cent. If a further subtraction of the compound fracture cases as being a problem of sepsis rather than brain injury is made, the figure again declines, reaching a minimum of 10.3 per cent. It is evident then that in the present state of our knowledge, the proper use of therapeutic dehydration and lumbar puncture decompression applied in accordance with a diagnosis based upon a proper conception of the pathology of brain injury should permit only about 10 per cent of patients suffering from the ordinary forms of skull and brain injury to die. If all possible types of skull and brain injuries are included the mortality should be not over 16 per cent. The greatest opportunity for improvement lies in an earlier and more accurate diagnosis of the meningeal hemorrhages, and certain rarer forms of brain injury, and an increasingly earnest attempt to elimi-

CHART 5

	Totals		Living		Dead		% Mortality	
	Neuro-Surgical	Rest of Hospital	Neuro-Surgical	Rest of Hospital	Neuro-Surgical	Rest of Hospital	Neuro-Surgical	Rest of Hospital
Concussion*	0	496	0	492	0	4		0.8%
Edema, Contusion and Laceration	376	339	335	243	41	96	10.9%	28.0%
Rupt. of Middle Meningeal Artery	10	7	3	1	7	6	70.0%	85.0%
Subdural Hematoma	30	33	19	1	11	32	36.6%	90.6%
Compound Fracture	60	47	41	19	19	28	31.6%	59.5%
Depressed Fracture	29	23	28	14	1	9	3.4%	39.1%
Period Covered	3½ yrs		4 yrs					

Under "Rest of Hospital" this diagnosis "Concussion" includes all forms of brain injury as well as linear fractures of the skull. Under "Neuro-Surgical" the diagnosis of "Concussion" is used only as described in the text.

The mortality in my own group of 505 patients is 15.6 per cent (Chart 6). Furthermore it has been my experience that any case of skull or brain injury that dies after the first thirty-six hours, providing they have been brought promptly to the hospital does so because of a failure on my part to make a correct diagnosis

nate postoperative sepsis in compound fractures of the skull.

SUMMARY AND CONCLUSIONS

1. The diagnosis of craniocerebral injury is firmly established on a pathological basis. It includes linear, depressed and compound frac-

tures, concussion, edema, contusion and laceration of the brain, extra- and subdural hemorrhage, and a few other less common forms of skull and brain injury

2 The immediate prognosis of cerebral injury after head trauma can be fairly good. In this series of 1494 cases the mortality was 17 per cent. In a group of 405 cases of the common types of brain and skull injury, the mortality was 10.3 per cent. A 20 per cent group mortality implies inaccurate diagnosis, improperly applied treatment or lack of experience with a sufficiently large number of cases.

3 One treatment for the usual forms of brain injury has been standardized. It consists of the preliminary treatment of surgical shock, when present, followed by therapeutic dehydration and repeated lumbar puncture for decompression. Treatment of compound and depressed fractures, meningeal hemorrhage, and the less common forms of brain injury is not considered in this paper.

4 If improvement does not set in and continue under this treatment, and if toxic dehydration and meningitis can be ruled out, bilateral exploratory temporal trephines are indicated to eliminate the possibility of undiagnosed sub- or extradural hemorrhage, or one of the less common types of brain injury.

5 Cases treated as above, or by lumbar puncture alone, have a mortality nine per cent less than similar cases treated without lumbar puncture.

6 In over 1000 lumbar punctures for decompression in acute brain injuries there has been no death attributable to this procedure.

7 Therapeutic dehydration is suitable treatment for traumatic edema of the brain. In combination with decompression by lumbar puncture it is suitable treatment for traumatic contusion and laceration of the brain. Improperly used it may cause unexpected and severe symptoms.

8 The use of morphin is dangerous in cases where increased intracranial pressure is suspected. It should never be administered under such circumstances.

9 Increased intracranial pressure does not aid in the prevention of bleeding from the cerebral vessels.

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AMEBIASIS IN CONNECTICUT*

BY JOHN H. FOSTER, M.D.†

REPORTS of amebic dysentery among visitors to the World's Fair in Chicago during the past few months have called the attention of the whole country as well as of the medical profession to the importance of this disease. New

England probably has received its proportion of acute and chronic amebic infection from this new national focus of infection. Two cases of amebic dysentery were discovered in Waterbury as soon as the notice was sent out from Chicago. Amebiasis is still considered a tropical disease, but there have been many warnings from public health authorities over the high incidence of carriers throughout the United States as dis-

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covered by the routine surveys by Kofoid¹, Boeck and Stiles², Craig³, Johnstone, David and Reed⁴ and others. In 1932, 100 cases of amebic dysentery were reported to the United States Public Health Service⁵ from California and nearly 500 cases from Louisiana. It is not a reportable disease in most states so no accounts are available from the whole country. It is probably much more common in the northern states than is generally realized. It has seemed to me timely to call attention to amebic infection as seen in Connecticut and to note some of the forms the disease may take.

In 1923 Blake and Hiscock⁶ from the New Haven Hospital reported nine cases occurring in a small epidemic in Ansonia, Conn. They had seven cases of amebic dysentery and two of liver abscess. (The source of that epidemic is still uncertain and only one more case was discovered subsequently.)

In the ten years since that report up to the time of the Chicago incident, there have been twenty cases of amebic infection with fifteen deaths reported to the State Department of Health of Connecticut⁷. In addition there have been eight cases in the last two months, six of them originating in Chicago.

During the last four years I have seen eight cases of amebic infection in my practice which have been of sufficient interest to report more or less in detail, as they illustrate some of the types of infection encountered and emphasize the importance of recognition of amebic infection even in Connecticut.

CASE 1. A. S. C. (1246) a 33-year-old male was seen in 1930 complaining of diarrhea, abdominal distress gas and lower abdominal pain of four weeks duration. In his past history Mr. C. had lived six years in different parts of China as a teacher and in the consular service. He had an attack of dysentery in Indo-China on his return to the United States in 1921 which lasted six months. Ever since this he has had a tendency to loose stools but an examination at Johns Hopkins Hospital in 1926 was entirely negative.

Stool examinations showed mucus and cysts of amebae. Sigmoidoscopic examination showed superficial ulcerations. Treatment was given of colonic irrigations, emetine yatrien and stovarsol for a period of six weeks and cleared up the symptoms which have not returned.

CASE 2. Mrs. L. 42 years of age (2237) came to see me in February, 1933, complaining of pain in the left upper abdomen, general weakness, palpitation and gas of several months' duration. She gave a history of having lived in Shanghai for several years up to 1928 but never having had dysentery. Feces examination showed cysts resembling *Entamoeba histolytica*, and sigmoidoscopic inspection revealed a low grade of colitis. On treatment with rectal instillation of 1:100 solution of quinine and with stovarsol by mouth her symptoms cleared up, she gained weight and has been much improved. The pain in the region of her splenic flexure has disappeared completely.

An example of the chronic ulcerative colitis was CASE 3, Mr. W. G. (2006), 52 years of age who com-

plained of attacks of colitis off and on from 1914, at which time he lived in Ansonia. Seen in May, 1932, he was having frequent stools with mucus and at times blood. His general health was poor; he was underweight, weak, had palpitation and tightness in his chest when climbing hills and some nocturia.

Mr. G. weighed 130 lbs., was very pale and almost cachectic in appearance. Sigmoidoscopic examination showed a chronically ulcerated sigmoid and rectum with membranous patches. Many motile amebae containing RBC were seen in the fresh smears. He responded immediately to stovarsol therapy and gained 30 lbs. in two months. He is still free from symptoms and he claims to be in perfect health although I have not examined his colon since.

A case with more acute symptoms was seen in a patient from Naugatuck (1018), CASE 4, in July, 1933. I was attending the man's wife at the time who was suffering from a chronic mucus colitis which was definitely not of amebic origin. Mr. W. 44 years of age, while in Cleveland in June, was taken with an attack of diarrhea and for three to four weeks had been having frequent stools especially at night, not loose but the feces surrounded with fresh mucus and blood. Stools showed typical vegetative amebae and sigmoidoscopic examination showed ulcerative and membranous colitis. Scrapings from the membrane showed the motile amebae containing many RBC. A course of stovarsol caused his symptoms to clear up so promptly that I could not get him to come in for a check-up for nearly four months during which time he was symptom-free. Mr. W. had been at the Congress Hotel in Chicago three or four weeks before the onset of his dysentery.

In October 1933 I had the privilege of seeing a patient, Mr. A. W. (CASE 5) 49 years of age in consultation with Dr. S. J. Mullins in Danbury.

This man had attended the Chicago Fair in September. About ten days after his return he felt ill and developed pain in his lower abdomen. Dr. Mullins found a temperature of 100°, tenderness in the right lower quadrant, a leucocyte count of 12,000, 84% polys and diagnosed an acute appendicitis. The patient refused operation but symptoms increased and two days later and after a consultation an appendectomy was performed. A swollen and definitely suppurative retrocecal appendix was found and removed.

He was making a good recovery when about ten days after the operation he began to pass small amounts of blood and mucus. The stools increased in frequency so that he was having from 20-30 stools daily. His temperature was 102-103° and pulse from 120-140. He was failing rapidly and was in a critical condition when amebae were demonstrated in his stools. Sigmoidoscopic examination showed a very severely ulcerated rectum and sigmoid with a very foul odor to the discharge. Typical motile RBC containing amebae were present in the mucus scraped from the membrane and ulcers. Emetine 1 gr daily intramuscularly, carbarsone 0.25 grams twice daily were started. He improved greatly within a few days and has made a good recovery although his convalescence has been slow.

Pathological report on the appendix by Dr. J. O. Collins of the Waterbury Hospital.

Sections (figs 1 to 4) show an appendix which has been split on one side. The lumen of the organ contains a moderate amount of exudate desquamated epithelium and cellular debris. Within the exudate are noted a number of spherical bodies about 35 microns in diameter which stain a bluish pink with hematoxylin and eosin. Some of these spherical bodies contain small vacuoles and red



FIG 1 Low power ($\times 100$)* view of appendix with ameba in the pus in the lumen



FIG 3 Section of mucosa and submucosa of appendix showing larger number of entameba histolytica

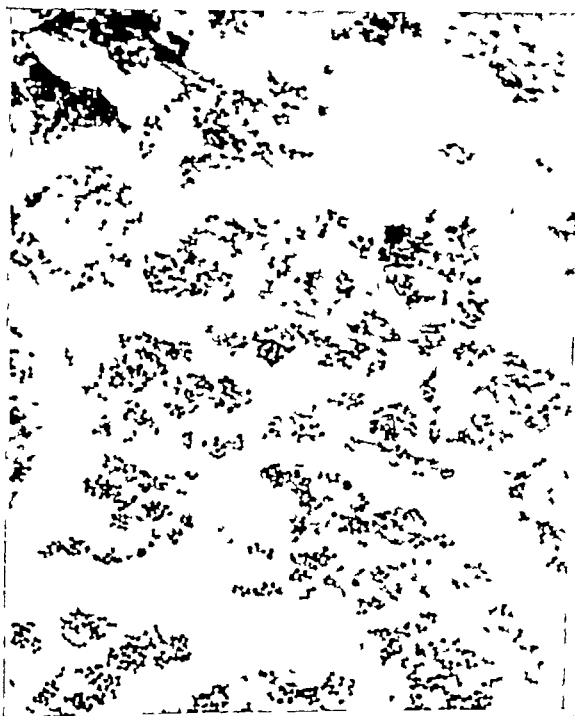


FIG 2 Higher power ($\times 375$)* of same section showing ameba more distinctly



FIG 4 Higher power of same section showing ameba in more detail containing vacuoles and red cells

*Editor's Note This illustration was slightly reduced

blood cells their size and morphology are consistent with a diagnosis of amebae. The mucosa is interrupted in a number of places by ulceration. Amebae are found in large numbers in the floor of these ulcers. The ulcers are quite deep, some of them extending into the submucosa. The mucosa is congested and shows scattered areas of hemorrhage. Polymorphonuclear leukocytes and eosinophilic leukocytes are rather numerous in the mucosa. The submucosa and muscle layers show definite infiltration with all types of wandering cells, among which polymorphonuclear leukocytes are predominant. There is one small area of suppuration in the muscle layer. There is rather marked fibroblastic activity throughout the wall of the organ. The serosa is decidedly thickened by proliferating fibrous tissue in which are numerous infiltrating round cells and plasma cells.

Diagnosis: Amebic ulcers of appendiceal mucosa with subacute appendicitis.

Sub Note*

CASE 6. Mr. A. J., an Italian, 47 years of age, gave a history of severe attacks of ulcerative colitis in 1925 and 1928, each lasting for several months, which cleared up after prolonged treatment with rest, diet and irrigations, bismuth and foreign protein therapy. Amebae were never demonstrated in his stools. For the past five years he has been free from symptoms, although not enjoying really good health. In November of this year he had a recurrence of his diarrhea with some blood and mucus. Questionable amebae were found in a stool examination but definite RBC containing amebae were found in the mucus obtained from a sigmoidoscopic examination. The mucus membrane showed irregular areas of inflamed mucosa, hyperemic but not ulcerated. Treatment has been emetine and carbarsone with prompt improvement in all his symptoms.

The following case M. H. (CASE 7) was first seen in 1922 in Changsha, China, at the age of two and has been seen at intervals since then. At that time she seemed fairly normal except for a tendency toward anemia and lack of energy. In June of that year she left with her parents on a furlough, traveling almost continuously for the next months. Just before arriving in the United States in October she began to have a bloody diarrhea. She was in the New Haven Hospital under the care of Dr. Grover Powers with few interruptions from November 1923 to August, 1924. Her symptoms were chiefly diarrhea and a fever which at times reached 102°. Amebae were reported in the first stool examination but could not be confirmed. She was given emetine on the basis of the clinical picture but with no apparent improvement. She continued to have a low grade fever and diarrhea. There was a moderate secondary anemia, white counts that varied between 20,000 and 30,000 and occasionally small amounts of blood in the stool but repeated stool examinations were negative.

The last day of February the child was readmitted with a temperature of 103° and she remained in the hospital this time for five months. She was seen by all the prominent medical people in New Haven and by a number of visiting pediatricians, both American and European. Stool examinations to the number of about 200 were made, urine examinations, x-rays, cultures of blood, urine and feces, precipitin tests of urine, animal inoculations, Wassermann and agglutination tests, all were negative. The secondary anemia increased and the white blood

count was consistently high, reaching 47,000 in March. The spleen became slightly enlarged and there were a few enlarged venules on the abdominal wall but no ascites. An exploratory laparotomy revealed a large indurated liver with increase in the connective tissue lying between the lobules and some points of apparently central fatty degeneration. A lymph node removed at the time of operation was negative on microscopic examination. In addition to emetine—santonin nearsphenamine and tonsillectomy were tried, all with very little effect on either the bloody diarrhea, the fever or the anemia. The fever gradually became less and a series of five transfusions were begun at the end of May. 150 cc of citrated whole blood was given each time with apparently beneficial effect. When she was discharged from the observation of the clinic, she was about normal weight and height, had 4,280,000 red cells per c.mm., her temperature still was slightly elevated, (99°) and there was diarrhea and the stools contained blood. The diagnosis with which she returned to China was "idiopathic tropical cirrhosis of the liver." Further transfusions were recommended and a diet free from roughage. Prognosis was poor as that little understood condition was generally regarded as fatal.

During the autumn in Changsha her condition remained about the same. The red cells remained over 4,000,000 and in spite of occasional exacerbations of the diarrhea she seemed quite well. Many stool examinations were made but it was not until February 24th, about sixteen months after the onset of the disease, that amebae were undoubtedly found in the stool. Emetine was given again at first in quarter grain doses, later the doses were increased to one grain but only nine grains were given in five weeks time. A great deal has been written of the resistance of cysts to emetine, the so-called emetine fast cases, so yatrien (chiniofon) was next used. She later had a relapse with a temperature 100-101°. Her blood count dropped to 3,800,000. She was given an intraperitoneal transfusion of 300 cc of citrated blood. The improvement from this time on was marked. She seemed more vigorous. The liver returned to normal size. The blood disappeared from the stool and the consistency became firmer and more normal. The control of defecation which had become very poor did not return to the usual state until early in 1926. She had abdominal pain during the next year, but in general her health was much improved. Stovarsol was given for four courses during the year. Since 1927 she has lived in New England. From March 1928 to June 1931 she had recurring attacks of bloody diarrhea with fever of 103-104° and with stools positive for amebae. She has been in the hospital in Hanover, New Hampshire and in the Children's Hospital in Boston for observation and study. Treatment has consisted of emetine, bismuth, nearsphenamine, bismarsen and gentian violet which were given at various times up to March 1933, although no amebae have been found since July 1931. Her present condition seems to be satisfactory.

CASE 8 is a nurse, 38 years of age, now living in Danbury. From 1921 to 1925 she was in China. In June 1922 she had an acute enterocolitis and a low grade appendicitis. Later she had an appendectomy but was not well all summer. In October she had acute catarrhal jaundice but was well from then on to the winter of 1924-1925 when she developed bronchitis and ran a persistent low fever of 99-100°. She had vague abdominal pain but no colitis. There were suspicious signs in her chest and by x-rays and as she had a family history of tuberculosis she was returned to the United States in

*Surgeons resent the criticisms in some of the newspaper and medical reports of cases of amebiasis being operated upon for appendicitis. From the pathological findings in this case it would seem that the diagnosis of acute appendicitis was correctly made and that appendectomy was definitely indicated.



FIG 1 Low power ($\times 100$)* view of appendix with ameba in the pus in the lumen



FIG 3 Section of mucosa and submucosa of appendix showing larger number of entameba histolytica.

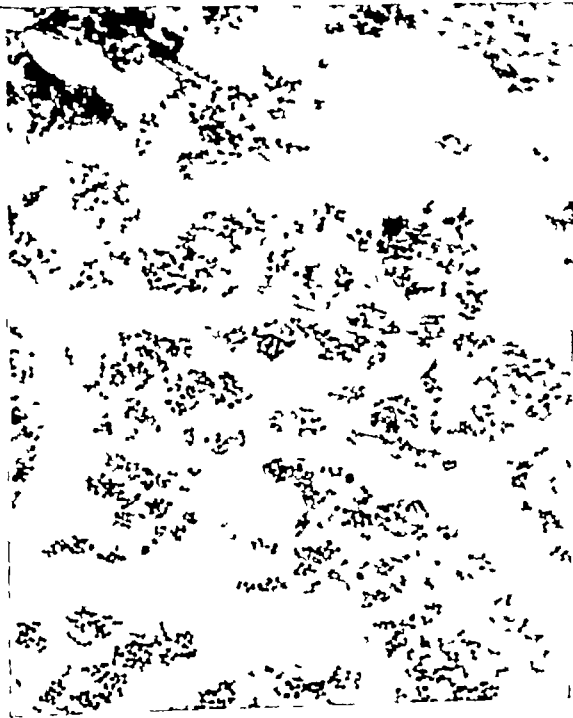


FIG 2 Higher power ($\times 375$)* of same section showing ameba more distinctly



FIG 4 Higher power of same section showing ameba in more detail containing vacuoles and red cells

*Editor's Note This illustration was slightly reduced

native Chinese were carriers of entameba histolytic cysts and about 25 per cent of the foreigners. Eight to ten per cent is reported to be the incidence in the United States.

Case 3 apparently carried his infection for eighteen to twenty years from a probable infection in Ansonia. There was no apparent transmission to other members of his family.

The etiology in cases 4 and 6 was puzzling until the announcement from the Chicago Board of Health.

TREATMENT

There are several drugs that have a specific amebicidal power. First used was ipecac, and with its active principle emetine they were for years the most effective preparation known, but toxic effects often appeared before cure was obtained. Yatren (or chiniofon) is less toxic but has not proved reliable. Acetarson (or stovarsol) is more effective but considerably more toxic due to its high arsenic content. Carbarsone¹⁰ is a recent amebicide recommended and seems to hold much promise. It is an arsenical (28% arsenic content, 4 carbamino-phenol-arsenic acid) but it is much less toxic than stovarsol and has a therapeutic index eight times greater. It also has the advantage of being considerably less expensive. Vioform¹¹ is an oxyquinoline preparation belonging to the same group as yatren which has been highly recommended, but with which I have had no personal experience.

COMMENT

The number of cases noted would hardly justify their presentation but for the fact that all of these individuals had symptoms which had resisted treatment, some of them for years and from many physicians, but which responded to specific amebicidal therapy when the etiological agent was discovered.

It is well to call attention again to the symptoms other than dysenteric, viz., the low grade gastro-intestinal complaints in cases 2 and 6, the hepatitis in case 7, also the acute appendicitis in case five which was of amebic origin.

No studies have been made of the incidence of amebic cyst infection in the contacts of the persons studied but no cases with symptoms of

amebiasis were found in any of their households.

SUMMARY

(1) There have been over 30 cases of amebiasis reported to the State Department of Health in Connecticut in the last ten years with 15 deaths.

(2) Details of eight cases are given illustrating various types of acute and chronic infection. Four of the cases originated in China, two contracted their infection in Chicago. The source of infection in the other two cases is not clear.

(3) The symptoms varied considerably, vague gastro-intestinal symptoms in two, diarrhea, blood and mucus in the stools in others with varying degrees of prostration. Pyrexia and hepatitis in one and an acute suppurative amebic appendicitis in another.

(4) The therapy of amebiasis is highly specific. Of the various amebicides available, emetine, yatren, acetarson, vioform and carbarsone, the last-named seems to be the safest and most effective.

(5) Amebiasis is already endemic in Connecticut and there will probably be more cases developing as a result of the Chicago epidemic. Amebic infection should always be considered in the diagnosis of gastro-intestinal disorders.

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PAPILLARY CARCINOMA OF THE RENAL PELVIS

Report of a Case

BY H. A. CHAMBERLIN, M.D.,* AND H. E. MACMAHON, M.D.*

TUMORS arising from the transitional epithelium of the urinary tract are found most commonly in the bladder, and only rarely in the pelvis of the kidney. In both of these sites they usually assume one of three rather characteristic forms, namely, simple papilloma, papil-

lary carcinoma, and invasive tumors resembling the squamous cell carcinomas of the skin. A papillary carcinoma of the renal pelvis is a comparatively rare tumor, and cases diagnosed correctly on the basis of careful clinical and roentgenological studies before operation warrant reporting. The number of cases in the literature is still small and due in part to this, the diagnosis is often extremely difficult.

Chamberlin—Professor in Urology, Tufts College Medical School. MacMahon—Professor of Pathology and Bacteriology at Tufts College Medical School. For records and addresses of authors see "This Week's Issue" page 330.

the summer of 1925 and was sent to the Gaylord Farm Sanatorium, Wallingford, Conn., for four months' observation.

After careful study she was discharged with the diagnosis undetermined, but they decided she did not have tuberculosis. Dr A B Dayton in New Haven after saline purging found amebae and small ulcers in the sigmoid. Her symptoms promptly improved with emetine treatment. She still has occasional recurrences of abdominal distress and fever.

THE ENTAMEBA HISTOLYTICA

The *Entameba histolytica* is the only human pathogenic ameba. It enters the body through the mouth in the encysted form and is in itself evidence of fecal contamination from some preceding case of amebiasis. This protozoan makes its habitat in the mucosa of the colon where through its proteolytic power it buries itself in the submucosa and lives and reproduces indefinitely. No symptoms may be noted for months or years. The *Entameba histolytica* is held in check by the body resistance, the vegetative form remaining in the mucosa. The amebae escaping in the lumen become contracted and are excreted in the feces in the encysted form. This is the latent or carrier state.

Exacerbations of activity due to various causes produce increased ulcerations of the intestinal mucosa, an ulcerative colitis, with typical symptoms of dysentery. With the increased peristalsis the mucus contains blood and numbers of amebae in the motile or vegetative stage.

From the usual location in the submucosa of the colon the amebae may be carried to other organs and there have been many cases reported of this so-called systemic type of amebiasis.⁷ As illustrations abscesses of lung, liver, brain, spleen, hepatitis and ulcers of the skin may be cited. Amebae have been reported in the urine, semen and in cases of iritis, thyroiditis and salpingitis.

Kofoed reported finding amebae in the lymph glands of Hodgkin's disease and in the bone marrow in cases of arthritis deformans. His views, however, have never been very widely accepted. Boeck⁸ has recently shown that bone involvement is very unlikely and that Hodgkin's disease is not associated with amebic infections. He points out, however, that small amebic lymphatic ulcers may act as definite foci of bacterial systemic infections.

It is important to remember that it is only in the encysted stage that the ameba can be transmitted to a new host. The vegetative forms which are present in the acute dysenteric stage die very soon after exposure to air. It is even difficult to keep them alive long enough for satisfactory laboratory examination.

It might be well also to recall the experiments of Walker and Sellards⁹ in 1914 in the Philippines who fed amebic cysts to 20 volunteers in a Manila prison. Of the 20, two (10%) never did

show any cysts. Of the 18 who showed cysts and became carriers only 4 (20%) developed symptoms of dysentery and they came down at periods of 20, 57, 87, and 98 days after the feeding experiment. None of the 20 men fed with vegetative amebae developed dysentery or became carriers.

Diagnosis. The most important point is to consider the possibility of its presence. Amebae should be suspected in all cases of colitis and the stools should be carefully examined microscopically. The technique of stool examination is described in many textbooks but is often confusing. Training and experience are necessary.

In the acute stage the motile ameba should be present and usually in large numbers in the mucus. They can be seen with the low power lens but under the high power the characteristic irregular shape, the ameboid movements and appearance of RBC inclusions verify the diagnosis. They are usually 30-50 m in diameter. The warm stage and stool are not absolutely necessary, but the stool should be fresh. There are certain characteristics in the microscopic picture in the fresh smear of a stool from an amebic dysentery as opposed to bacillary dysentery that help in differentiation. The amebic stool is quite free from bacteria, the mucus will contain many RBC but comparatively few WBC. Charco Lyden crystals are often present and there is not much fecal debris. The bacillary stools contain many bacteria and pus cells with a smaller number of RBC and much detritus. The long standing chronic amebic ulcerative colitis may be complicated with secondary pyogenic infection which will give the appearance of the bacillary stool but ameba should also be present.

It is the diagnosis of the cystic stage that offers most difficulty and requires the trained protozoologist. Even they insist on smears stained with hematoxylin and iron for identification of the cysts. The technique is difficult and the diagnosis is uncertain and controversial. My own method is to ascertain the presence of cysts by making a fresh stool smear in 1 000 eosine solution, in which the cysts appear as clear refractile bodies, counterstaining with Lugol's solution, which brings out the nuclei. If amebic cysts are present the therapeutic test with emetine or stovarsol is applied. The difficulty in diagnosis in the systemic type is illustrated in case 7. There literally hundreds of stool specimens were examined before amebae finally appeared. In cases of amebic abscess it is often impossible to demonstrate the ameba. Stool cultures can be used in doubtful cases.

EPIDEMIOLOGY

In cases 1, 2, 7 and 8 the source of infection was in China. Surveys in Peking by Kessell and Faust showed that about 35 per cent of the

native Chinese were carriers of entameba histolytic cysts and about 25 per cent of the foreigners. Eight to ten per cent is reported to be the incidence in the United States.

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lary carcinoma and invasive tumors resembling the squamous cell carcinomas of the skin. A papillary carcinoma of the renal pelvis is a comparatively rare tumor, and cases diagnosed correctly on the basis of careful clinical and roentgenological studies before operation warrant reporting. The number of cases in the literature is still small and due in part to this, the diagnosis is often extremely difficult.

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REVIEW OF THE LITERATURE

Very recently MacKenzie and Ratner¹ reported a case in which a transitional-cell papilloma of the pelvis of the kidney showed evidence of malignant transformation. They reviewed the literature bearing on tumors of the renal pelvis, mentioning the early papers of Albarran², Albarran and Imbert³, Hunt⁴, Thomson-Walker⁵, and Meltzer⁶. In their own series of ninety-six cases of tumor arising within the kidney, only one was a primary growth of the renal pelvis. In textbooks of pathology, little or no space is given to this group of tumors. Sirter⁷ in describing the papillomata of the kidney pelvis, pointed out the resemblance of these tumors to papillomata of the bladder, and showed that they may appear as multiple tumors of the pelvis, ureter and bladder. Sirter believed that cases of bleeding from one kidney showing papillomata of the bladder, especially if these are situated about the ureteral orifice, should be considered as examples of multiple tumors, with similar papillary lesions in the renal pelvis.

CASE REPORT

Clinical History

G H B—White male, 71 years of age, was admitted to the Cambridge Hospital Oct. 16, 1932. About three months before entry he passed on several occasions, dark muddy urine. At that time there was no frequency, dysuria, or abdominal or lumbar pain. About one month later he noticed that his urine was again discolored, a condition which recurred about twice a week during the succeeding two months. During this time he felt intermittent pains, often severe in the left lumbar region, and lost both strength and weight. For the past two weeks he has passed no clear urine.

Physical Examination

A well developed, and fairly well nourished, feeble elderly male rational but dull and listless. An abdominal examination was negative with the exception of slight tenderness on firm pressure over the left kidney. Neither kidney was palpable. The external genitalia and prostate were essentially normal.

Cystoscopic Examination (October 17)

The bladder mucosa was normal except for slight congestion over the trigone. There was beginning trabeculation, but no intravesical enlargement of the prostate. The right ureter was catheterized with ease and normal urine was obtained. On the left side the catheter passed readily to the junction of the pelvis and ureter but could not be passed into the pelvis and no urine could be obtained.

Roentgenologic Examination of the Kidneys

Pyelograms were made of both kidneys. They were rather obscured by gas but appeared of about regular size and shape. The right kidney was easily filled with the injected fluid (12% sodium iodide solution) and was quite normal. The left showed a very poor and incomplete filling (see fig 1). The impression from a study of the pyelogram on the left side was that there was a pathological lesion within the pelvis, either a tumor or blood

clot, which prevented a normal emptying, and at the same time prevented the catheter from entering the pelvis.

The Laboratory Findings

The urine was brown, of neutral reaction with sp g 1.034. Sugar was absent. There was a trace of albumen, and an abundant sediment showing many red blood cells, and ten to fifteen white blood cells per high power field. The phenolsulphonphthalein test was unsatisfactory because of the discolorization, due to the presence of blood. The blood non-protein nitrogen was elevated to 66 mg per 100 cc. A blood count showed 4,100,000 R. B. C., 11,600 W. B. C., and Hbg 80 per cent. The dif

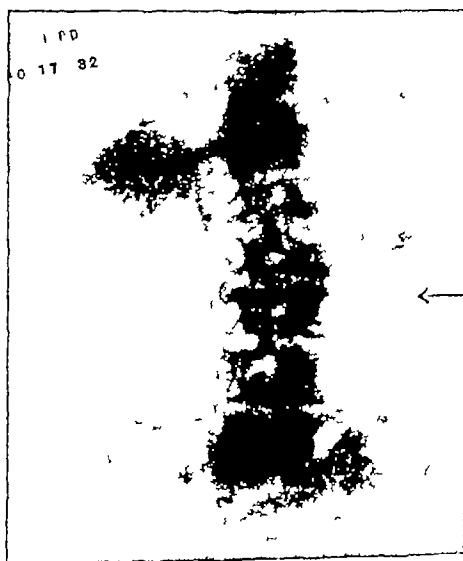


FIG NO 1 Photograph of pyelogram showing normal right kidney pelvis and filling defect of the left. The arrow indicates the location of the papillary tumor and just above this the dark round area represents a dilated calyx filled with sodium iodide solution.

ferential white count was 84 per cent polymorphonuclear leucocytes, 14 per cent lymphocytes, and 2 per cent mononuclear cells. The platelets were not diminished, and the R. B. C. showed no changes in size, shape, or staining.

Course of Illness

For three days following the cystoscopic examination, the patient's condition remained unchanged. On the fourth day, the temperature rose to 101°F, and the patient complained of moderately severe pain in the left upper quadrant and left lumbar region with point of greatest tenderness and spasm situated over the left kidney. Several days later, a definite mass was palpated in this area. The temperature and pulse remained elevated, pain and tenderness increased, and the patient was very ill, and without question was losing ground rapidly.

On October 23, one week after his admission the left kidney was operated upon under local novocaine anaesthesia. It was greatly enlarged, distended, and surrounded by very firm dense inflammatory adhesions. A nephrostomy was performed allowing a large quantity of turbid urine to drain from the kidney pelvis and a drainage tube was inserted into the renal pelvis. It did not seem advisable at this time because of the patient's poor condition to thoroughly explore the kidney. The patient, during the succeeding days, improved steadily and on the fifth day following this operation the temperature was again normal.

On November 14 three weeks after the nephrotomy, a nephrectomy was performed under spinal anaesthesia. The kidney, the pelvis and the upper part of the ureter were surrounded by very firm dense inflammatory tissue so that the pelvis could not be satisfactorily palpated. Because of the difficulty in reducing the pedicle to a size suitable for ligation, and a desire to finish the operation as soon as possible a large clamp was left on the pedicle without attempting to ligate it. The kidney on section showed a large papillary tumor arising from the pelvic wall which will be described in detail below.

The convalescence was uneventful. The clamp was loosened on the fifth and removed on the sixth day after the nephrectomy. The patient was discharged on November 29, two weeks after this second operation. At this time the blood non-protein nitrogen had dropped to 26 mg per 100 cc and the phenolsulphonphthalein output was within normal limits.

In March 1933 four months after leaving the hospital the patient was again examined. His general health had steadily improved. He had gained ten pounds and with the exception of slight and transient dizziness felt very well. A roentgen examination of the lungs and all bones was made at this time but no evidence of metastasis could be demonstrated. An abdominal examination was essentially negative. A left ureterogram showed no filling defect in the remaining portion of the ureter. The bladder mucosa appeared quite normal.

Now on September 15 1933 nearly a year since the operation, the patient's daughter reports that her father is in excellent health, and that he has gained an additional ten pounds since the date of the last examination.

PATHOLOGICAL REPORT (S 32-480)

The kidney from this patient showed many features of unusual interest. The tumor lying in the pelvis had caused a damming back of urine which later had become infected. This led to a chronic destructive prelititis, a pyelonephritis, and an infection of the perirenal fat tissue.

Gross Description of Specimen

The specimen consists of the left kidney together with considerable surrounding fat tissue. The perirenal fat and connective tissue are unusually firm

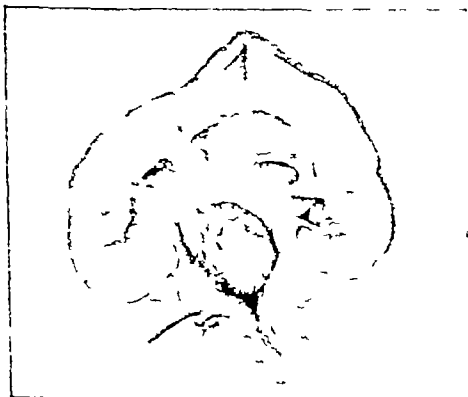


FIG NO 2 The papillary tumor lies in the lower portion of the kidney pelvis. The narrow stalk is clearly visible showing how the tumor could serve as a ball valve to the uretero-pelvic opening.

and are riddled with small petechial hemorrhages and small areas of necrosis and cellular infiltration (fig 2). The true connective tissue capsule strips very easily from a rather uneven kidney surface. Yellow rosette-like areas 1.2 mm in diameter and

bordered by a fine red zone are scattered irregularly over the surface of the kidney. Section of the kidney shows narrow yellow lines, radiating up from the pelvis throughout both cortex and medulla. The parenchyma is pale, swollen and rather edematous. The renal arteries and their larger branches have thickened walls. The pelvis and calices are dilated and contain coagulated blood, some turbid fluid and soft irregular masses of gray glistening partly necrotic tissue. The surface of the pelvis has a blood-stained reddish gray thickened opaque appearance. The papillae are here and there flattened out forming a base to the dilated triangular calyx. The veins at the margin of the cortex and medulla are slightly injected so that these two portions of the kidney are clearly differentiated from one another.

Just at the margin of the pelvis and ureter is a tumor growth approximately the size of a small prune measuring 3.5 x 3.5 x 3.5 cm. This is growing as a papillary nodule which is attached by a single narrow glistening pedicle. The pedicle itself is quite soft and there is no induration at the attachment of this pedicle to the pelvis of the kidney. The surface of the tumor mass is blood-stained, soft and gray. At some points it is rough and ragged and extremely friable and it is quite obvious that portions from the periphery of the tumor have desquamated into the pelvis of the kidney. Here and there over the surface of the tumor and at different points along the surface of the pelvis there are small calcified concretions. The tumor growth is hanging down into the dilated conical upper end of the ureter. In this position it has acted as a partial obstruction to the outflow of urine leading to hydronephrosis and its complications.

Microscopic Description

Several sections were taken from the kidney itself and from different portions of the tumor. The stalk



FIG NO 3 Section of the tumor showing villous-like processes. There is a delicate connective tissue stroma rich in capillaries. This is bordered by an orderly transitional type of epithelium.

of the tumor and the attachment of the stalk to the pelvis. The tumor shows an unusually varied picture. There are places in which it resembles the classical slowly growing benign papilloma of the bladder with a delicate connective tissue stroma

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CASE REPORT

Clinical History

G H B—White male, 71 years of age was admitted to the Cambridge Hospital Oct. 16, 1932. About three months before entry he passed on several occasions dark muddy urine. At that time there was no frequency, dysuria, or abdominal or lumbar pain. About one month later he noticed that his urine was again discolored, a condition which recurred about twice a week during the succeeding two months. During this time he felt intermittent pains often severe, in the left lumbar region, and lost both strength and weight. For the past two weeks he has passed no clear urine.

Physical Examination

A well developed, and fairly well nourished, feeble elderly male rational, but dull and listless. An abdominal examination was negative with the exception of slight tenderness on firm pressure over the left kidney. Neither kidney was palpable. The external genitalia and prostate were essentially normal.

Cystoscopic Examination (October 17)

The bladder mucosa was normal except for slight congestion over the trigone. There was beginning trabeculation, but no intravesical enlargement of the prostate. The right ureter was catheterized with ease and normal urine was obtained. On the left side, the catheter passed readily to the junction of the pelvis and ureter, but could not be passed into the pelvis and no urine could be obtained.

Roentgenologic Examination of the Kidneys

Pyelograms were made of both kidneys. They were rather obscured by gas, but appeared of about regular size and shape. The right kidney was easily filled with the injected fluid (12% sodium iodide solution) and was quite normal. The left showed a very poor and incomplete filling (see fig 1). The impression from a study of the pyelogram on the left side was that there was a pathological lesion within the pelvis, either a tumor or blood

clot, which prevented a normal emptying, and at the same time prevented the catheter from entering the pelvis.

The Laboratory Findings

The urine was brown, of neutral reaction with sp g 1.034. Sugar was absent. There was a trace of albumen, and an abundant sediment showing many red blood cells, and ten to fifteen white blood cells per high power field. The phenolsulphonphthalein test was unsatisfactory because of the discolorization, due to the presence of blood. The blood non protein nitrogen was elevated to 66 mg per 100 cc. A blood count showed 4,100,000 R B C, 11,600 W B C, and Hgb 80 per cent. The dif

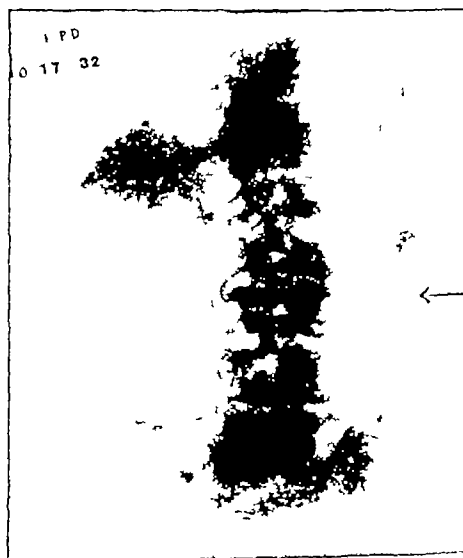


FIG NO 1 Photograph of pyelogram showing normal right kidney pelvis and filling defect of the left. The arrow indicates the location of the papillary tumor and just above this the dark round area represents a dilated calyx filled with sodium iodide solution.

ferential white count was 84 per cent polymorphonuclear leucocytes, 14 per cent lymphocytes, and 2 per cent mononuclear cells. The platelets were not diminished and the R B C showed no changes in size, shape, or staining.

Course of Illness

For three days following the cystoscopic examination, the patient's condition remained unchanged. On the fourth day, the temperature rose to 101°F, and the patient complained of moderately severe pain in the left upper quadrant and left lumbar region, with point of greatest tenderness and spasm situated over the left kidney. Several days later, a definite mass was palpated in this area. The temperature and pulse remained elevated, pain and tenderness increased and the patient was very ill, and without question was losing ground rapidly.

On October 23 one week after his admission, the left kidney was operated upon under local novocaine anaesthesia. It was greatly enlarged, distended, and surrounded by very firm dense inflammatory adhesions. A nephrostomy was performed allowing a large quantity of turbid urine to drain from the kidney pelvis and a drainage tube was inserted into the renal pelvis. It did not seem advisable at this time because of the patient's poor condition to thoroughly explore the kidney. The patient, during the succeeding days, improved steadily and on the fifth day following this operation the temperature was again normal.

On November 14, three weeks after the nephrotomy, a nephrectomy was performed under spinal anaesthesia. The kidney, the pelvis and the upper part of the ureter were surrounded by very firm dense inflammatory tissue so that the pelvis could not be satisfactorily palpated. Because of the difficulty in reducing the pedicle to a size suitable for ligation and a desire to finish the operation as soon as possible a large clamp was left on the pedicle without attempting to ligate it. The kidney on section showed a large papillary tumor arising from the pelvic wall which will be described in detail below.

The convalescence was uneventful; the clamp was loosened on the fifth and removed on the sixth day after the nephrectomy. The patient was discharged on November 29, two weeks after this second operation. At this time the blood non-protein nitrogen had dropped to 26 mg per 100 cc and the phenolsulphonphthalein output was within normal limits.

In March, 1933, four months after leaving the hospital the patient was again examined. His general health had steadily improved; he had gained ten pounds and with the exception of slight and transient dizziness felt very well. A roentgen examination of the lungs and all bones was made at this time but no evidence of metastasis could be demonstrated. An abdominal examination was essentially negative. A left ureterogram showed no filling defect in the remaining portion of the ureter. The bladder mucosa appeared quite normal.

Now on September 15, 1933, nearly a year since the operation, the patient's daughter reports that her father is in excellent health and that he has gained an additional ten pounds since the date of the last examination.

PATHOLOGICAL REPORT (S 32-480)

The kidney from this patient showed many features of unusual interest. The tumor lying in the pelvis had caused a damming back of urine which later had become infected. This led to a chronic destructive pyelitis, a pyelonephritis, and an infection of the perirenal fat tissue.

Gross Description of Specimen

The specimen consists of the left kidney together with considerable surrounding fat tissue. The perirenal fat and connective tissue are unusually firm

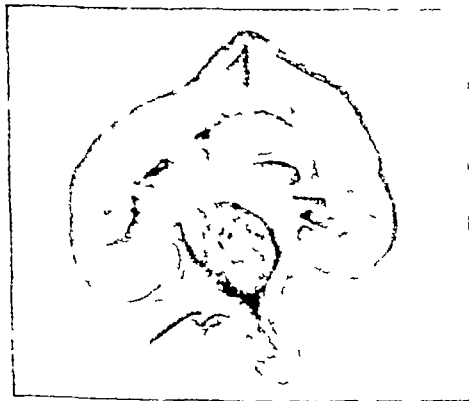


FIG NO 2 The papillary tumor lies in the lower portion of the kidney pelvis. The narrow stalk is clearly visible showing how the tumor could serve as a ball valve to the uretero-pelvic opening.

and are riddled with small petechial hemorrhages and small areas of necrosis and cellular infiltration (fig 2). The true connective tissue capsule strips very easily from a rather uneven kidney surface. Yellow rosette-like areas 1.2 mm in diameter and

bordered by a fine red zone are scattered irregularly over the surface of the kidney. Section of the kidney shows narrow yellow lines, radiating up from the pelvis throughout both cortex and medulla. The parenchyma is pale, swollen and rather edematous. The renal arteries and their larger branches have thickened walls. The pelvis and calices are dilated and contain coagulated blood, some turbid fluid and soft, irregular masses of gray, glistening partly necrotic tissue. The surface of the pelvis has a blood stained reddish gray thickened opaque appearance. The papillae are here and there flattened out forming a base to the dilated triangular calyx. The veins at the margin of the cortex and medulla are slightly injected so that these two portions of the kidney are clearly differentiated from one another.

Just at the margin of the pelvis and ureter is a tumor growth approximately the size of a small prune measuring 3.5 x 3.5 x 3.5 cm. This is growing as a papillary nodule which is attached by a single narrow glistening pedicle. The pedicle itself is quite soft and there is no induration at the attachment of this pedicle to the pelvis of the kidney. The surface of the tumor mass is blood stained, soft and gray. At some points it is rough and ragged and extremely friable, and it is quite obvious that portions from the periphery of the tumor have desquamated into the pelvis of the kidney. Here and there over the surface of the tumor and at different points along the surface of the pelvis there are small calcified concretions. The tumor growth is hanging down into the dilated conical upper end of the ureter. In this position it has acted as a partial obstruction to the outflow of urine leading to hydronephrosis and its complications.

Microscopic Description

Several sections were taken from the kidney itself and from different portions of the tumor, the stalk



FIG NO 3 Section of the tumor showing villous like processes. There is a delicate connective tissue stroma rich in capillaries. This is bordered by an orderly transitional type of epithelium.

of the tumor and the attachment of the stalk to the pelvis. The tumor shows an unusually varied picture. There are places in which it resembles the classical slowly growing benign papilloma of the bladder with a delicate connective tissue stroma

bordered by orderly rows of epithelial cells in parallel arrangement (fig 3). In other areas the tumor has lost this regularity and the cells vary in size

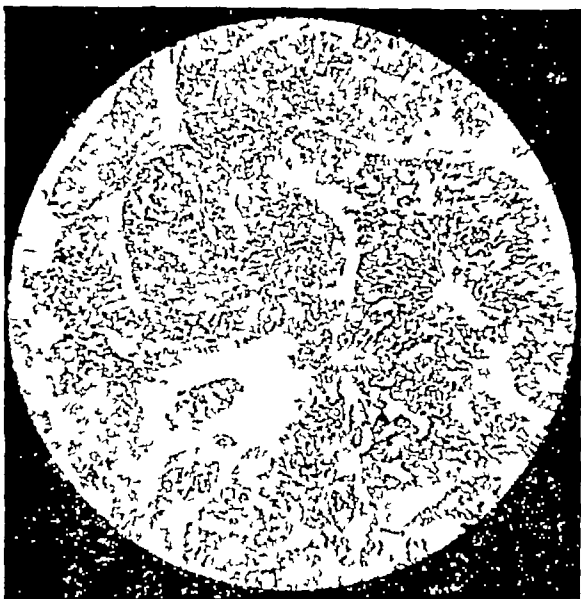


FIG NO 4. Section of the tumor in which the epithelial cells show a distinct tendency to form alveolar or gland like spaces. In such fields as this there are numerous mitoses but there is no evidence here of invasion or infiltration into the stroma.

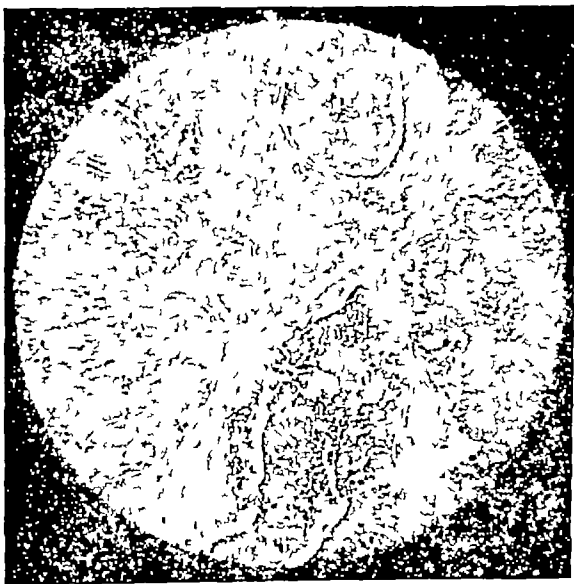


FIG NO 5. In this field the histological structure is more complicated. At the top is a nest of cells orderly and arranged in transitional formation as in Fig 3. To the right and left, the cells show the same filamentous gland like structures seen in Fig 4. In the center there is a field of tumor cells growing irregularly showing little or no differentiation and infiltrating the stroma and invading the lymphatics.

and shape the nuclei are unusually large mitoses both symmetrical and asymmetrical are common, and in spite of an existing papillary structure of the stroma the epithelial cells are growing in the most disorderly alveolar arrangement (fig 4). There are

spaces bordered by epithelial cells, filled with fluid containing very little protein. In some areas these cyst like spaces contain mononuclear cells, single or in groups. Portions of the tumor which show this rapid growth, with marked anaplasia, show rather widespread areas of necrosis along the tips of the papillae. The stroma is composed of delicate, thin walled vessels distended with blood. There are scattered foci of lymphocytes and mononuclear cells in the surrounding connective tissue stroma, and in some areas there is very widespread hyalin infiltration. The tumor in other areas is growing in still another manner, where expanding sheets of cells invade the stroma of the tumor and often arrange themselves to suggest pearl formation (fig 5). These cells are quite large, vary in size and shape have large nuclei rich in chromatin and frequently show both mitotic and amitotic nuclear division.

There is a chronic non specific inflammatory reaction along the entire surface of the dilated pelvis with partial destruction of the epithelium and scattered calcareous incrustations. At many points the infection has spread up and into the tubules producing quite extensive reactions within and about the tubules leading to destruction of the tubules, and abscess formation. Although the inflammation may be traced histologically to the periphery of the kidney, there is no evidence that the infection in the surrounding fatty tissue has followed a direct extension from that of the kidney. The inflammatory reaction about the kidney with destruction of wide areas of tissue, thrombosis of both arteries and veins hemorrhage, and necrosis, together with the formation of tracts of granulation tissue, was apparently the result of an infection spreading from the damaged and distended wall of the pelvis. There are still large areas of the kidney showing, with the exception of a slight swelling and granular degeneration of the cytoplasm of the epithelial cells of the convoluted tubules and little coagulated protein in their distended lumina, no pathological changes.

COMMENT

In a recent paper by MacKenzie and Ratner, the symptomatology of tumors of the renal pelvis is thoroughly discussed. Hematuria, pain, swelling in the region of the kidney, and the passage of tissue, comprise the more important urinary signs and symptoms. In the case herewith reported, there was at first only hematuria and pain in the left kidney region. No mass was palpable until obstruction of the ureter occurred. Pyelographic studies offered our most accurate aid to diagnosis. It was the filling defect shown in the pyelogram which enabled us to make a diagnosis of renal tumor, probably tumor of the kidney pelvis. The presence of blood clot in the kidney pelvis must always be considered as a possible cause of a filling defect of the type seen in this plate and in no way can a filling defect from the blood clot be definitely excluded in making a diagnosis. It is well recognized that the usual procedure in cases of papillary tumors of the renal pelvis is ureterectomy in addition to nephrectomy because of the frequency of secondary implantation along the urinary tract. In the case here reported, where the patient was definitely a poor operative risk, removal of the ureter was not considered justifiable. This case is of surgical interest in the following

respects (1) When the patient was first seen the tumor was not palpable, and a diagnosis of tumor was made chiefly on the filling defect shown in the pyelogram (2) A ball-valve occlusion of the ureteropelvic junction caused by the tumor led to a rather rapid development of an infected hydronephrosis and extensive pyelonephritis which demanded immediate nephrectomy (3) The dense inflammatory tissue surrounding the kidney and its pelvis made satisfactory palpation impossible and the kidney was removed on pyelographic evidence of tumor

From the standpoint of pathological histology this tumor is of unusual interest because it shows that within such a nodule both benign and malignant areas may be found, and, secondly, that by metaplasia several histologically different types of epithelial tumor may develop, namely regular transitional palisading, disorderly alveolar formation, and diffuse medullary areas, showing a tendency to pearl formation with invasion of the stroma

SUMMARY

A case of papillary carcinoma of the kidney pelvis is reported with both clinical and pathological studies. The intermittent signs and symptoms, probably best explained by the action of a ball-valve occlusion of the ureter at the uretero-pelvic junction by this pedunculated papillary tumor and the unusual and rather complex histological structure of the tumor are of unusual interest

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UTERUS DIDELPHYS

With Report of a Case

BY RICHARD H SWEET, M D

A. E ROCKEY writing in 1916 published an article on double uterus and vagina in which he remarks, although stating as his personal opinion that this condition is more common than ordinarily supposed, that the literature until that date contained very little reference to it. According to him the first sixty volumes of the *Annals of Surgery* do not mention it. Parry writing in Ashurst's System of Surgery thirty years previously treated of it and gives eight quotations from the literature. Kelly in his Operative Gynecology, published in 1898 gives an illustration of a case. In spite of this a survey of the literature reveals the fact that there had been considerable interest in the subject before, and indeed as early as 1705 Littere in the *Histoire de l'Académie Royale des Sciences* describes a case of true uterus didelphys in a female infant. The scientific merit of this description makes it of sufficient interest and value to quote it here. Littere says in part*, "M Littere, en dissequant une petite fille morte à l'âge de deux mois, trouva qu'elle avait le vagin partagé par une espèce de cloison en deux cavités égales, l'une à droite l'autre à gauche, de manière, cependant que la cloison était entière et ne formait deux cavités absolument séparées que depuis le milieu du vagin jusqu'à la matrice. Chacune de ces deux cavités aboutissait à une matrice particulière qui avait son orifice, son cou,

son fond, le tout parfaitement séparé de la matrice voisine, mais parfaitement semblable en figure en consistance en dimensions. Les deux matrices depuis le cou jusqu'à une certaine profondeur, n'étaient que comme une seule partagée en deux par un cloison mais leurs fonds étaient entièrement distincts et détachés l'un de l'autre. Chaque matrice n'avait qu'un ovaire et qu'une trompe, qu'un ligament rond et qu'un ligament large."

At the end of this careful and concise description of the condition observed in the case, one finds this interesting philosophical speculation illustrating the state of knowledge of that day

"Si tous les animaux ont été immédiatement formés par la main du Souverain Ouvrier, on ne peut guère s'empêcher de croire que ceux d'une même espèce ont été formés entièrement semblables et que les configurations ou dispositions extraordinaires de parties viennent de quelques accidents fortuits du développement des oeufs et les monstres du mélange de plusieurs oeufs. Mais comment cette matrice double a-t-elle pu être l'effet d'un accident fortuit du développement? Il est difficile de l'imaginer. Ces accidents peuvent détruire, déplacer, altérer quelques parties, mais pas en produire de nouvelles. Serait ce que deux oeufs femelles se seraient attachés ensemble et que toutes parties de l'un auraient péri excepté la matrice, qui, par conséquent se serait

Editor's Note According to the manuscript.

*Sweet—Assistant in Surgery Massachusetts General Hospital. For record and address of author see 'This Week's Issue' page 300.

trouvée double sur le fœtus résultant de ce mélange? Cette supposition paraît un peu forcée, et peut-être, cependant n'y a-t-il rien de plus recevable."

In the literature since Rockey's publication, one finds increasingly frequent case reports of great interest and several articles dealing with the points of major importance from the standpoint of embryology, symptomology and especially the influence of the condition on parturition. Notable among these are those of Dubreuil-Chambardel, P Findley, F C Newton, and N F Miller.

Many varieties of uterine anomalies resulting from partial or incomplete fusion of the Muellerian ducts are known. The embryological origin of all of these is now well understood and has been too often described in the literature to require any re statement here. There is, however, still some confusion as to the terminology used to designate the various forms of bipartition of the uterus. The term *uterus didelphys* is used to designate the condition where there is complete failure of fusion of the Muellerian ducts resulting in total duplication of the genital tract with two uterine fundi, two cervixes and two vaginae. By certain writers the term is applied only to the very rare cases which include in addition a bipartite vulva. But ordinary usage does not necessarily make this limitation. Lesser degrees of duplexity are to be referred to as uterus bicornis with or without a partial vaginal septum and with a single or double cervix, or in cases where fusion has fallen just short of normal, as uterus septus with or without vagina septa. Obviously all of these several degrees of partial or complete biparity of the genital tract are characterized by the presence of no more than two ovaries and two fallopian tubes. On the other hand, it is not uncommon, as in the case here reported, to find atrophic or absent tubes or ovaries on one or both sides in these patients.

A fact of interest which is brought out by a review of the cases reported in the literature is that uterus didelphys, as well as the lesser degrees of congenital biparity of the genital tract, is frequently associated with other curious congenital anomalies of development. In the author's case there was an abnormality of the anus and an incomplete rotation and fixation of the colon. Absence of one kidney, usually the right, has been reported several times. Patent urachus, double anus, the occurrence of a cloaca, and duplication of the bladder have all been reported.

Much has been written on the complications of this condition, especially the dangers which result from pregnancy and parturition. But a thoughtful observer must admit that dangerous complications are less common than ordinarily supposed and that many cases have been dis-

covered by mere chance examination. Indeed many cases are on record where the presence of a didelphys uterus has not been detected until after one or two children have been born. The clinical importance of this condition, however, concerns chiefly the obstetricians. Abortion is frequent, occurring according to Dunning in 23 per cent of the cases as quoted by Findley. Labor is often prolonged because of weak uterine musculature. Rupture of the uterus is fairly common for the same reason and postpartum hemorrhage is said to be slightly more common than in the normal uterus. Although spontaneous delivery is the rule, one of the major obstetrical difficulties which may arise in these patients is obstruction of labor resulting from incarceration of the non-gravid uterus in the pelvis. This occurs as a result of rotation of the non-gravid uterus into the hollow of the sacrum as the gravid uterus enlarges. Because of this condition, cesarian section has frequently been performed, but as Findley points out, this possibility should not lead one to advise radical measures such as hemi-hysterectomy or elective cesarian section without a test of labor because of the natural tendency of these patients to deliver spontaneously. The patient whose case is reported here was delivered of four normal children without difficulty or prolongation of labor. Torsion of a pregnant horn has been reported by H W Horn. Streptococcal infection as a result of puerperal sepsis of the non-gravid uterus has been reported. For an excellent review of the obstetrical aspects of this condition the paper of Findley presenting the results from a study of 135 cases of uterus didelphys should be consulted.

Complications and associated lesions which occur as a result of uterus didelphys in the non pregnant state, have been frequently described. Hematocolpos on one side is fairly common, hematometra also occurs as well as hematosalpinx, all the result of stenosis and occlusion of one genital tract at various levels. This condition has been treated by unilateral salpingectomy or hysterectomy. A case of gangrene of one uterus as a result of torsion has been reported. Fibroids may occur and carcinoma has been noted, but there is no evidence to show that these lesions are any more frequent in uterus didelphys than in a normal single organ.

Cotus in this condition is usually confined to one vagina and as a result of this, the other vagina remains small and often virginal. There are cases on record, however, of impregnation in both sides, either alternately as in the case reported by Davies and Cellan-Jones, or concurrently as reported by Garcia. One must, therefore, recognize the theoretical possibility, in these patients of a true superfœtation and cases of multiple pregnancy of this sort have been reported. Patients with uterus didelphys

are said to be unusually fertile, although as noted above, there is a compensatory high rate of spontaneous abortions. One should note with regard to function that coition, pregnancy, and parturition commonly proceed perfectly normally and without ill effects in these patients. To recognize this fact is to save many of these women from unnecessary and ill-advised operative interference. To recommend surgical measures in these women with no other justification than the mere presence of this congenital anomaly cannot be justified on the basis of experience and to operate excepting for known pathological conditions is no more reasonable for them than it would be for a normal person.

CASE REPORT Date of first visit November 4 1931

S L G aged 29 years applied complaining of pain in the right lower quadrant of the abdomen.

PRESENT ILLNESS Three months before entry she began to have attacks of pain in the right lower quadrant at first induced by lifting or bending over and followed by persistent dull aching pain in the same region in the intervals between attacks. Associated with this was the occasional occurrence of faintness and in addition a continual dragging pain in the pelvis similar to what she experiences during menstruation. She consulted her physician who referred her for diagnosis to a hospital clinic which started her on a round of visits to various hospitals each giving her somewhat different advice and contributing to her growing state of confusion and anxiety about her condition. The main tenor of opinion was to operate and remove part or all of her reproductive organs. During the week preceding entry she had been confined to bed with an ice-bag to her side which gave her some relief.

PAST HISTORY The patient was born in New Hampshire and has always lived in New England. She has enjoyed excellent health until the past two years. There is a history of measles and pertussis and occasional tonsillitis while a small child. She was born with a single opening for her digestive and urogenital tracts. At the age of thirteen years she was admitted to a Boston Hospital where she was subjected to a series of three operations purporting to separate the digestive and urogenital tracts by constructing a new rectum and anus. Tonsillectomy was also performed while she was in the hospital. There is no history of injuries or of operations or hospital entries except as mentioned above.

The cardiorespiratory gastro-intestinal and neuromuscular systems have never been involved in any disease or been the cause of any symptoms.

Urinary History There was enuresis until after the operation on the rectum and vagina after which there was never any more urinary difficulty.

Catamenia Her periods began at the age of thirteen years regular every twenty-eight days lasting four days requiring four napkins a day. The last two periods have been prolonged slightly and more profuse as a result she thinks of an examination under ether performed at another hospital. No metrorrhagia. She has always had some dysmenorrhea which consists of a sharp pain in the side of the abdomen with dragging pain in the back and lower pelvis.

MARITAL HISTORY The patient has been married thirteen years. Husband is alive and well. There are four children alive and well. Two miscarriages

one the first pregnancy at seven months following a fall the other which was the third pregnancy, at four months after being thrown down a flight of stairs. She was ill for several weeks after each miscarriage. All four children were full term, breech deliveries the last one a difficult one requiring high forceps.

PHYSICAL EXAMINATION The patient was in a state of great anxiety about her health. The general examination revealed nothing remarkable except carious teeth. There was tenderness in the right lower quadrant of the abdomen but no rigidity. Examination of the vulva revealed a double vaginal orifice each side leading into a separate vagina both vaginae lying side by side in a transverse plane. At the apex of each vagina was a perfectly formed cervix the left much smaller than the right and nulliparous in appearance. The right cervix was moderately lacerated transversely as a result of pregnancy. Each uterus could be felt bimanually. That on the right was about the size of a normal fundus and in addition there was apparently a smaller very tender elongated mass attached to it. The left uterus felt small and was not tender. The anus was very close to the double introitus and the sphincter was apparently incomplete anteriorly, this portion being replaced by a thin band of tissue at what is normally the four

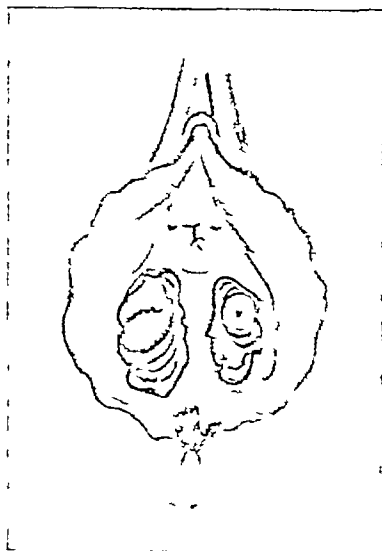


FIGURE NO 1 Appearance of the vulva showing double introitus vaginal septum and separate cervices

chette. This condition represents the end result of previous operations to form a separate anal opening.

DIAGNOSIS A preoperative diagnosis of uterus didelphys with right chronic salpingitis was made.

OPERATION November 19 1931

On examination under ether anesthesia it could not be determined whether the mass on the right side was only the uterus or whether it was partly tumor. A laparotomy was therefore done through a right paramedian incision. The gallbladder was explored and found to be negative. The colon was abnormally rotated the cecum pointed upwards and the appendix extended up toward the liver. From this point the transverse colon extended obliquely downward toward the left side of the pelvis where there was a very redundant sigmoid which ended in the rectum which seemed to disappear between the

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RECURRENT TRICHOBEZOAR*

Report of a Case

BY DARWIN E. BENNETT, M.D.

CASES of "hairball" or trichobezoar are unusual and warrant reporting. This case presents several interesting features. In the first place, it is an instance of recurrent trichobezoar, the first hairball having been removed twenty years previously. The only other case appearing in the literature in which there was recurrence was reported by Harris¹ in 1925. In this instance the bezoar reformed and was removed six times in thirteen years. The one recorded here was not recognized until twenty years following the removal of the first hairball.

In the second place, this patient is fifty years old, the oldest patient reported to date. The next oldest was Gemmel's² case, an insane man

of forty-three. The great majority of cases reported are girls and young women.

The third interesting feature is the chronicity. Although the patient had undoubtedly carried the tumor for many years, careful questioning failed to elicit any history of gastro-intestinal symptoms except marked constipation. The tumor was discovered only when she came to the hospital because of another complaint.

CASE REPORT

A fifty-year-old native-born white woman entered the Peter Bent Brigham Hospital on February 13, 1933 because the daily trips to the Outdoor Department for the dressing of a large gluteal abscess were too great a drain on her generally debilitated condition. She is the mother of three children two of whom died in infancy and she had four miscarriages between pregnancies. She has worked hard all her life at tasks involving a great deal of drudgery. Twenty-five years ago she worked for several months in a shop where she made wigs and

*From the Surgical Clinic of the Peter Bent Brigham Hospital.

†Bennett—Surgical House Officer, Peter Bent Brigham Hospital, January 1, 1932–May 1, 1933. For record and address of author see "This Week's Issue" page 330.

two uteri. It was noted that the colon had a very long transverse mesocolon so that the colon hung down much longer than the great omentum which was not adherent to the transverse colon as it is normally, but hung from the stomach as a separate sheet. The uterus on the right was about normal size for a woman who has had children. It had one tube extending from the cornu. The ovary on this side was normal. The uterus on the left side lay down along the side of the pelvis and was considerably smaller than that on the right. It was about the size of that of a girl of 16. It had a rudimentary tube which was adherent to the posterior and lateral surfaces of the pelvis and which faded out in the peritoneum. The only sign of an ovary on this side was a small nodular mass about 1 cm in diameter. It is questionable whether this rudimentary ovary is functional. The right tube was removed. The left tube was divided and tied on either side. The right uterus which had a marked tendency to prolapse into the pelvis was suspended by a modified

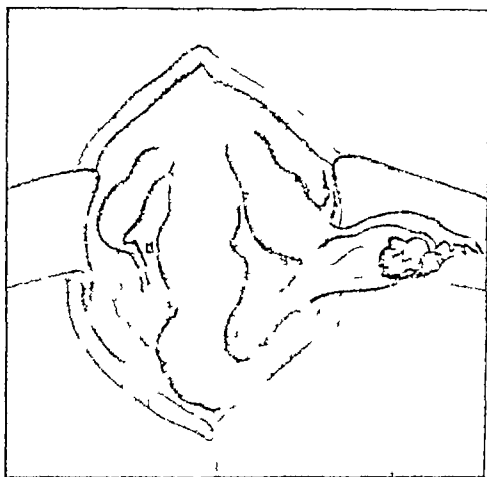


FIGURE NO 2 Intra abdominal view showing condition of uteri tubes and ovaries. Right tube and ovary shown as withdrawn from the abdomen for inspection

unilateral Olshausen suspension, suturing the round ligament up to the abdominal wall by means of a suture passing through the rectus sheath and the rectus muscle and tied on the inside. The space between this suture and the lateral peritoneal surface was obliterated by means of a stitch. The appendix was then removed by means of a cautery and the stump inverted. The colon was then placed down into the pelvis so as to avoid contact of the small intestines with any raw surfaces (Fig 2).

POSTOPERATIVE DIAGNOSIS Uterus didelphys atresia and hypoplasia of the left tube, hypoplasia of the left ovary congenital abnormal rotation of the colon, congenital anomaly of the great omentum.

Convalescence was uneventful and healing was complete. The patient was discharged at the end of two weeks.

Follow-Up Notes

January 20 1932 Feels much improved, better than for many months. Complete relief from pain.

August 23, 1932 Very well. No pain or discomfort of any sort. Menses normal and relatively free from pain.

February 3, 1933 Still very well. No symptoms.

COMMENT

There are certain aspects of this case which are of interest. As is so often true, there were

other congenital anomalies, in this case of the gastro-intestinal tract. Incomplete rotation of the colon appears to be one of the most common associated conditions. I have operated on another patient with this type of colon who also had a uterus bicornis. The lack of attachment of the great omentum to the colon is of passing interest. The anomaly of the anus which was present in the case presented is less common. Details about this condition during childhood when she had some sort of a plastic operation are lacking, but there was apparently a cloaca like arrangement similar to what has been reported by other observers.

Cotus in this patient was always effected through the right vagina and all six pregnancies were in the right uterus. In view of the findings at operation, an element of interest arises from the concept that this woman is provided by nature with a device for the prevention of conception. The hypoplastic imperforate tube on the left would make the entrance of spermatozoa impossible after coitus through the left vagina. On the other hand, as she has demonstrated, coitus through the right vagina resulted readily in impregnation.

Significant in this case is the fact that all of the surgeons whom she consulted had unnecessarily radical ideas regarding treatment. Duplexity of genital organs is normal to this individual and not in itself a cause for symptoms and much less a reason for radical surgery such as extirpation of one side with division of the vaginal septum, as advised by the majority. The truth of this statement is borne out by the fact that gestation and parturition, save for two miscarriages each following a fall, were uneventful and also by the return to a perfect state of health following the exercise of conservative surgical procedures. To this woman the assurance that it was unnecessary to do a partial or complete hysterectomy restored her emotional balance, and it is reasonably certain that, had she been subjected to this procedure, she would have become a nervous invalid.

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patient was unquestionably ashamed of the habit and though she denied the direct accusations she suggested that she might have eaten her hair in her sleep. Following the operation she was seen on several occasions pulling out her hair, but her shyness made it impossible to catch her actually putting hair in her mouth.

SUMMARY

This instance of trichobezoar is noteworthy because it represents a recurrence, because of the patient's age (fifty years), and because of the probable absence of any gastro-intestinal symptoms over a very long period

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THE SYMPTOMS OF HIDDEN OCULAR MUSCLE IMBALANCE

BY F. W. MARLOW, M.D.*

LACK of appreciation of the symptoms which may be due to muscle imbalance and particularly to hidden muscle imbalance (latent heterophoria), accounts for many of the numerous patients who suffer year in and year out from headache, gastric disturbance, neurasthenic and psychasthenic symptoms in spite of the fact that they have consulted both general and special physicians of high rank. This lack of appreciation on the part of the profession is partly due to the fact that textbooks, both of general medicine and ophthalmology, fail to give the attention to the subject or to lay the stress upon it which its importance justifies. In fact neither in the general nor special literature does the subject receive the consideration due to it. But it is hard to credit the statement of a recent writer that, "a routine muscle examination is seldom made even in private practice." Just how true this is the present writer is in doubt, but it is certainly true that if the motor apparatus of the eyes were accorded the same detailed attention which the refraction commonly receives, the failures to obtain relief would be fewer. Just as it is essential to measure not only the manifest but also the latent refractive error, so also is it essential to measure not only the manifest but also the latent muscle imbalance.

No doubt Bielschowsky is correct in stating that headache and other asthenopic symptoms cannot be explained by anomalies of refraction and motility alone. Predisposition of some kind, sometimes acquired, more commonly inherited, is present in determining whether the individual can carry the load and show no symptoms or by lowered resistance will break down under it, and consequently come under observation for any of a group of symptoms of the neurasthenic type. In many of these cases improvement in general health, by whatever means, may eliminate the symptoms, at any rate

for the time being, but in many others all treatment fails until both accommodative and particularly any muscle imbalance strain is removed.

There are, therefore, three factors requiring consideration, namely, the refraction, the muscle balance, and the general health.

The influence of refractive error can be eliminated with a high degree of certainty because with the aid of cycloplegia an accurate measurement of it can be made. When competent medical advice has also failed to effect relief by improving the general health it may be assumed that further efforts in that direction are futile. The only factor remaining for investigation is the muscle balance.

The 100 consecutive cases upon which the present paper is based are those left over, so to say, after repeated attempts at relief by correction of refractive errors and manifest muscle imbalance, and by treatment of the general health by physicians have failed to relieve or have aggravated the symptoms.

In other words these are cases in which the influence of all refractive error and manifest imbalance has been eliminated, the same being true of the influence of the general health, yet the symptoms, apparently those of eye-strain, persist. This clears the field for a more intensive investigation of the latent phorias and their bearing on the symptoms complained of. It may be proper to state here precisely what is meant by a latent phoria.

The common tests for muscle imbalance, or heterophoria, depend on the temporary annulment of binocular vision by covering one eye with a card, the other eye fixing a light at 6M distance, shifting the card to the other eye and noting whether the eye remains stationary and whether the patient sees any apparent movement of the light. If the eye and the light remain stationary then no imbalance is demonstrated or vice versa. This and similar tests based on the same principle are of short dura-

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"switches" Twenty-one years ago she entered the Brockton Hospital, Brockton, Massachusetts, because of an attack of nausea and vomiting. At an exploratory operation a hairball which weighed two pounds was removed from her stomach. At that time she gave a history of having lost her hair six years before. (Most of the past history was obtained from the records of the Brockton Hospital after the patient had reluctantly admitted having been treated there.)

For six years prior to her recent hospital admission, she has been troubled with rheumatism, falling of the womb and intense itching. About one year ago she experienced a low grade chronic pain in the region of her left hip and eight months ago a lump appeared in the left gluteal fold. It was



FIG 1 Roentgenogram. The appearance of the hairball when outlined by the opaque meal. Note the projection into the antrum of the stomach and the absence of an air bubble in the fundus.

somewhat tender and bothered her in getting up and down. Gradually it increased in size and on the day of entry to the dispensary it broke spontaneously, discharging about a quart of pus. The abscess was debrided under gas-oxygen anesthesia. After two visits for dressings of the indolent infection the patient was unable to make the daily trip and was sent into the hospital for observation.

Physical examination. The patient was an elderly emaciated white woman with thin brown hair turning grey. Her facies was pale haggard and apprehensive. Her psyche was apparently normal though her intelligence quotient was low. The skin was blotchy with many small, brown pigmented areas and acne-like scars more numerous over the back. The hair was pediculous and there were lesions typical of scabies on the hands and thighs. The mucous membranes were pale and atrophic. Examination of the chest showed the diaphragm high and relatively fixed on each side. A hemic murmur was heard all over the precordium. Her blood pressure was 110 systolic over 75 diastolic. The abdomen was asymmetrically rounded and slightly distended by a large hard movable and non tender mass which filled the entire left upper

quadrant and presented a definite notch along the right border just above the umbilicus. The mass was interpreted as an enlarged spleen. The region of the left great trochanter was quite markedly tender to palpation and there was limitation of abduction of the left hip. The fingers showed the lesions of atrophic arthritis. There was a 7x5x5 cm defect lined by granulation tissue in the left gluteal fold. She weighed 100 pounds and her temperature was 100.2° (F).

Laboratory data. White blood count was 13,500; hemoglobin was 40% (T); red blood count was 3,800,000. A differential count (Wright's stain) showed 80% polymorphonuclears, 19% lymphocytes,

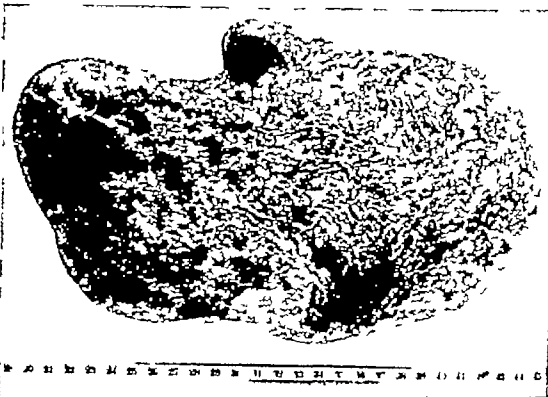


FIG 2 Hairball. Weight 1720 Gm. Measurements 25x14x8 cm. Note the projection on the left border which filled the antrum. Above the projection is the notch palpated on physical examination.

and 1% basophils. The blood smear showed marked achromia and slight variation in size and shape of the red cells. The platelets were normal. A gastric analysis both before and after operation showed no free hydrochloric acid. No foreign material was noted in the specimens. Urine, stool and serology negative. A culture from the abscess cavity grew *Staphylococcus aureus*. A guinea pig inoculated with curettings from the abscess cavity was negative for tuberculosis.

Roentgenograms of the left hip showed calcification in the soft tissues but no bone involvement. A barium enema showed no downward or right displacement of the splenic flexure, as would have been present with a spleen as large as the mass palpated. When the patient drank barium it was seen to hesitate at the cardia and then trickle slowly down, over, and around a large nonopaque foreign body which completely filled the stomach and extended into the antrum but not through the pylorus. This was interpreted by Dr M C Sosman as a trichobezoar (Fig 1).

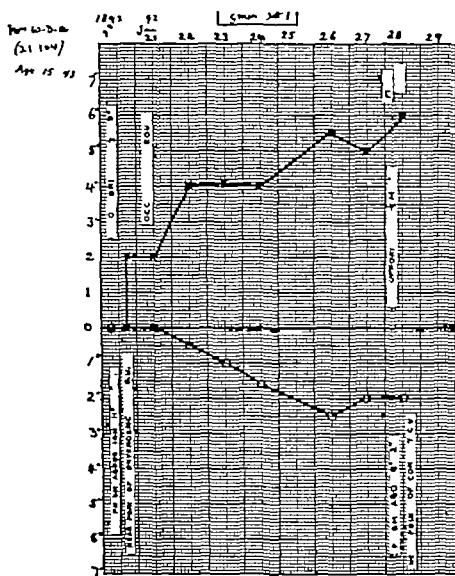
Hospital course. On February 24 1933 Dr E C Cutler removed the bezoar through a left transverse abdominal incision and a 20 cm incision in the fundal region of the stomach. The specimen measured 25x14x8 cm and weighed 1720 Gm (3.78 lbs). It consisted of fine-textured dark brown hair firmly matted together (Fig 2). The bezoar is now in the Warren Museum at the Harvard Medical School and after three months desiccation weighs 550 Gm (1.2 lbs).

The patient made an uncomplicated recovery from the operation but in the three months since the removal of the bezoar the infection in the left gluteal region has not cleared up and the anemia has improved only slightly. Repeated attempts were made to elicit from this patient a confession of swallowing her hair, but we were unsuccessful. The

R +0.50s +0.25c 80°, L +0.50s Tests showed exophoria 2°. An occlusion test begun on that day and continued for seven days brought out left hyperphoria 2° and exophoria 6°. She was given right eye $1\frac{1}{2}^{\circ}$ prism base in L 2° base in down 30°, in addition to the refractive correction, and a note in January, 1923 stated that there had been no recurrence of styes.

In this case the latent phoria was of much more importance than the refractive error or her general health, no improvement being effected until after its correction.

Graph 1 shows the gradual manifestation of the deviation under prolonged occlusion.



GRAPH 1

In this graph and the following "V" when placed above the zero 0° line indicates divergence (exophoria) when below it convergence (esophoria) when on the 0° line no lateral deviation.

"O" when above the zero line indicates a deviation of the right eye upward (R hyperphoria) when below it a deviation of the left eye upward (L hyperphoria). When on the zero line that the eyes are on the same level.

CASE 2 Mrs F O (59 129) Severe photophobia and asthenopia Under observation since age of 33 on account of headache and other asthenopic symptoms and photophobia Examined and prescribed for from time to time until the age of 57, at which time the photophobia became extremely distressing and was unrelieved by refractive correction (low hyperopic astigmatism) or other treatment. At every examination up to this time she had shown a perfect muscle balance (orthophoria). At the end of a 16 day occlusion test she showed R Hyperphoria 3° and exophoria 1° 3°, and a 2° prism base down for her right eye added to her refractive correction gave prompt and complete relief.

In this case nothing was accomplished until the hidden muscle imbalance was demonstrated and allowed for in the glasses.

GROUP 2

Stomach symptoms vary from chronic so-called nervous indigestion to severe gastric upsets either in association with headache or alone. Nausea may be directly associated with use of the eyes.

Cyclical vomiting in children or young adults which may be regarded as a variant of sick headache.

That assimilation is interfered with is mainly shown by the increase in weight which often follows the correction of a phoria.

CASE 3 Mrs L P M, aged 33 (641.) Indigestion, headache photophobia—impaired assimilation Seen March, 1911, the subject of headache since childhood, constant for the past five years, in temples occiput and vertex, not accompanied by nausea. For the same period she had been the subject of intractable indigestion which has resisted all effort at treatment. She was running down in general health. A sister had died following a similar group of symptoms and 'malnutrition,' and her friends thought she was going the same way. Glasses had been prescribed which were an approximately accurate correction of her refraction (hypermetropic astigmatism) which aggravated her headaches though she could not go without them. Tests for muscle balance showed exophoria 6° and right hyperphoria less than $\frac{1}{2}^{\circ}$. A 2° prism base in was added to each lens and gave some temporary relief. At a later date an occlusion test lasting eight days brought the exophoria up to 14° and revealed left hyperphoria 2 $\frac{3}{4}^{\circ}$. Glasses correcting 7° of exophoria and 2° of hyperphoria gave complete relief from the symptoms for a time. A little later partial tenotomies of the left superior rectus and right externus were done. During the next six months she increased 15 pounds in weight and although she has had some occasional headache and indigestion she has called herself well ever since. Twenty-one years have elapsed since the operations.

This case emphasizes very forcibly the futility of general medication and refractive correction in the presence of a latent and uncorrected phoria. It shows also the influence of the latter on assimilation.

CASE 4 Miss H. V, aged 20 (A9240) Cyclical vomiting Seen December 12 1932. A history of vomiting spells in childhood which ceased in high school and did not recur until the spring of 1932 when she had what she called a bilious attack. She was wearing at that time a $1\frac{1}{2}^{\circ}$ prism base in over each eye. Since the omission of these prisms two months ago she has had attacks of uncontrollable vomiting preceded by pain in the right eye. The symptoms did not yield to general treatment, which included an appendectomy. Vomiting recurred a week after operation and her physician then advised examination by an ophthalmologist, the previous glasses having been prescribed and furnished by an optometrist. These lenses were +0.25s +0.25c 180° each eye. Examination under cycloplegia showed in each eye emmetropia or very low hyperopic astigmatism low esophoria no hyperphoria. In other words the result of the examination was practically negative. An occlusion test was then done and showed that she had a deviation of the left eye upward (left hyperphoria) varying from $1\frac{1}{2}^{\circ}$ 3 $\frac{1}{2}^{\circ}$ and no lateral deviation. A $1\frac{1}{2}^{\circ}$ prism base down before the left eye was prescribed. Seven weeks later she writes 'I am feeling just fine' 'no headache' and 'no trouble with my stomach.'

In this case also the influence of general medical and surgical treatment, and refractive error correction had been eliminated leaving muscle imbalance as the most probable source of the trouble. This was confirmed by the prolonged

tion It has been found by experience that they are not long enough to permit muscle relaxation to take place and therefore that they often do not reveal the whole error or even the kind of error. A prolongation of the cover test for a week at least is necessary to effect a relaxation of the muscles and to show the kind and degree of imbalance. In other words the cover test, which is generally recognized as the most satisfactory, is simply extended in point of time.

The writer has gone over his records of these 100 consecutive cases in which repeated correction of the refraction and attention to general health have failed to relieve the symptoms or have aggravated them, and noted the symptoms recorded in each case. In these cases a prolonged occlusion test finally revealed important errors of muscle balance, the correction of which afforded the desired relief in a majority of them. It is therefore fair to assume that the symptoms were due to latent deviation undemonstrable by the ordinary short tests. The frequency of the more important symptoms is approximately shown by the figures accompanying them. The other symptoms noted occur with far less frequency but nevertheless are worthy of consideration, and their persistence in spite of previous treatment may constitute a presumption of an undemonstrated strain.

These symptoms may be divided into three main groups, (1) local or ocular (2) disturbances of digestion and assimilation and (3) functional disturbances of the nervous system. It is quite common to find that many patients present symptoms not of one group only, but often of all. Thus one of the commonest groupings is that of headache, photophobia and indigestion. Photophobia indeed is so commonly present, in association with other symptoms, that its absence lessens in one's mind the expectation of finding a latent phoria, but it may be absent. It is recorded as having been present in 61 of the 100 cases, but this probably understates its frequency. The same is true of the headache and asthenopia, respectively noted in 64 and 68 cases. Gastric disturbances of one kind or another occur in 69 cases.

The following list shows the great variety of symptoms which may be caused by hidden muscle imbalance.

1 Local or Ocular	Styes	
	Chalazion	
	Chronic conjunctival congestion	
	Blepharo-spasm	
	Twitching	
	Blinking	
	Photophobia	61 cases
	Asthenopia	68 cases
	Aching etc.	} 27 cases
	Smarting, burning	

2 Stomach	Indigestion	24 cases
	Nausea and Vomiting	} with or without } 44 cases out headache }
3 Nervous System	Anorexia	
	Faulty Assimilation	
	"Billious" Attacks	
	Cyclical Vomiting	
	Headache	64 cases including neck and back in 18 cases
	Head not clear	
	Confusion in head	
	Irritability	
	Nervousness	
	General Fatigue	
	Vertigo	8 cases
	Mental Inefficiency	
	Psychoneurosis	

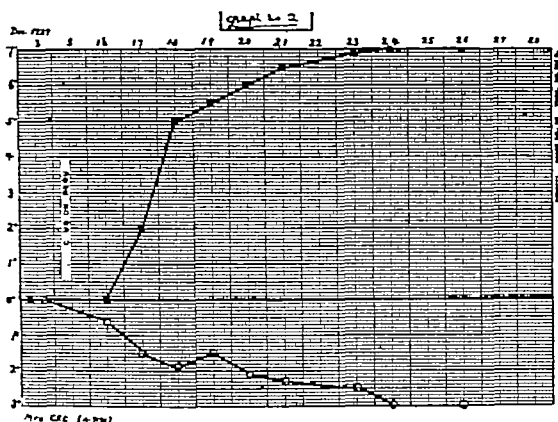
GROUP 1

The two most outstanding symptoms in this group are asthenopia and photophobia. For the asthenopic symptoms, repeated examination and refractive correction have been made without success. Many such patients state that they have to remove the glasses on account of the increased strain caused by them and after a while have to replace them because they cannot see without them or have some other type of discomfort. They are not comfortable either with or without the glasses. This may be interpreted as meaning that without glasses there is accommodative strain, and that with the glasses, which correct the refraction, the muscle strain is aggravated, presumably because the better defined retinal images require more exact superposition and consequently the demands on the extrinsic muscles are greater. As previously stated photophobia is present in a large percentage of the cases, is commonly of lifelong duration and may vary in degree from slight discomfort to a degree of intensity necessitating the constant wearing of smoked glasses. The most severe and troublesome cases of photophobia seen by the writer have been due to this cause. These patients often come wearing smoked or tinted glasses, and if they do not actually scowl present a characteristic mid-frontal vertical furrow just above the root of the nose, in itself alone very suggestive of muscle imbalance. The other manifestations named are of less frequent, but still somewhat common, occurrence.

The two following cases belong to this group.

CASE 1 Mrs W D A., wife of physician (21 204) With styes, headache and asthenopia. Under care for asthenopic symptoms since the age of 16 (1892). Then the right eye was emmetropic and the left showed hypermetropic astigmatism 0.25D (under cycloplegia). Orthophoria. Slight changes were made in her correction from time to time until 1919. From April of that year until January, 1920 she suffered from a succession of styes which recurred in spite of the use of yellow oxide of mercury ointment and other treatment. Headache and insomnia were also present. Her refraction on Jan 21, 1920, was

and the right inferior rectus were done after a period of temporary relief by prisms. There was an immediate alleviation of the symptoms enabling him to continue his work, with gradual improvement



GRAPH 2

When seen last in October, 1932 he reported that he has been quite comfortable until within a few weeks. Examination showed that he required some modification of his refractive correction and more presbyopic correction.

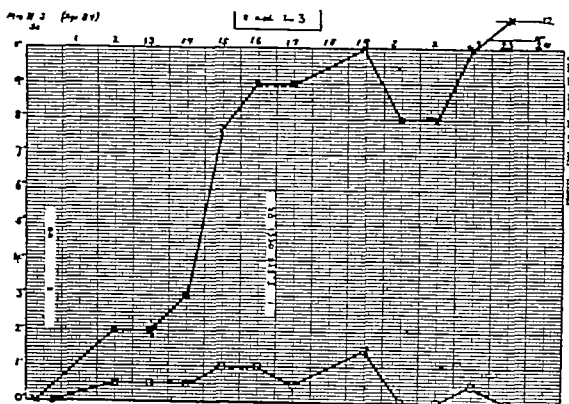
CASE 8 G M (A4876) Lecturer on psychology. Extreme *asthenopia* relative mental inefficiency. This man had suffered all his life from asthenopia and photophobia with some intervals of comparative freedom from symptoms. The symptoms had been intensified during the seven years preceding his coming under observation in the last two of which he was so incapacitated that he had to have his work read to him. During these seven years he had consulted nine oculists and other specialists all of national reputation without relief. A seven day occlusion test brought out 6° of exophoria and 1¼° of left hyperphoria the partial prismatic correction of which gave complete relief. This patient was kind enough to write out a full history of his case, which is published in his own words in the *Archives of Ophthalmology* Vol LVII No 4 1928 and is referred to here because at a later date he published a book on the history of psychology and assured the writer that the part written after his correction was incomparably superior to the earlier portion showing the influence of a latent phoria on mental efficiency.

CASE 9 Mrs E F H (A9084) Consulted me first on September 8 1932 on account of seeing specks but gave a history of having been run down for one and one-half years and apparently having a nervous collapse in August, 1931.

She had seen various doctors during this time and in November 1931 went to the Syracuse Psychopathic Hospital on account of extreme nervousness and various ideas. She was disturbed about the question of free will had some thoughts of suicide thought she had lost her soul and various other bad things about herself. She was very irritable and her neighbors annoyed her. For seven months she was unable to sleep even with sleeping powders. At the Psychopathic Hospital nothing definitely wrong was found although Dr H A. Steckel the chief of staff said that a tentative diagnosis of dementia praecox was made. After leaving she became desperate had no interest in anything even in her son and wanted to go back to the hospital.

Later she went voluntarily to the Marcy State Hospital for three months, at the end of which time she realized that she was not insane and returned home.

Examination of her eyes showed a low degree of astigmatism in each eye scarcely enough to be worth correcting or to be responsible for any nervous symptoms. It should be added that the symptoms pointing to eyestrain were intolerance of light, slight blurring in the distance and headache, which occurred daily and occasional nausea. Her muscle balance was quite normal. No lateral or vertical deviation could be detected. Cycloplegia revealed no accommodative spasm. An occlusion test was begun on the same day the cycloplegic was used (September 10). There was a rapid development of divergence. The deviation went to 9° on the sixth day. Seven days later it amounted to 12°. During the period of the occlusion test she showed a varying amount of deviation of the right eye upward (See Graph 3). The final test, however, showed the



GRAPH 3

eyes to be on the level. The exophoria was partly corrected with prisms 2¼° base in each eye the result being complete relief from all her symptoms.

She is well is not nervous does not worry about the question of free will or her soul and has put on flesh. Describes herself as being 'perfectly fine'.

This is only one instance of many in which a latent phoria proved to be an important factor in the production of mental disturbance but it is the most extreme.

CONCLUSION

These cases and many similar ones in a series of about 2000 occlusion tests have forced the writer to the conclusion that eyestrain cannot be acquitted of responsibility for symptoms of the various kinds here described without a carefully carried out prolonged occlusion test. Although it is an annoying thing to do, patients of sufficient intelligence to understand the object of the test when it is explained to them in a simple manner, accept it very readily, especially when they are the subjects of distressing symptoms which previous treatment has failed to relieve. As a matter of fact most patients become interested in the test as it proceeds and express willingness to carry it out as long as necessary.

cover test and the correction of the error so found

CASE 5 Mrs L C W (A8377) Aged 25 "Bilious" attacks, photophobia and asthenopia History of injury to head from fall from bicycle at the age of 10 When first seen in June, 1931 she complained of "bilious" attacks followed by headache for the past five or six years, recently occurring every week, for which she had received no benefit from medical treatment She was wearing glasses which were an approximate correction for her refraction Under cycloplegia she accepted R+0.50s, L+0.25c axis 85° Muscle tests showed a normal balance As such errors as she showed were quite inadequate to explain her symptoms, and as the latter were very suggestive of eyestrain, she was put through a prolonged occlusion test lasting eight days At the conclusion of the period there was a divergence of $6\frac{1}{2}^{\circ}$ and a deviation of the left eye upwards of 3° Prisms, correcting 2° of the hyperphoria and $3\frac{1}{4}^{\circ}$ of exophoria, combined with her refractive error gave prompt relief, which is maintained after 18 months She has had no attack since

Here again attention limited to general health and refraction completely failed to accomplish anything, and the sequel definitely proved that the latent phoria was the cause of the trouble

GROUP 3

Disturbances of the nervous system may be grouped under the general term of neurasthenia or nerve exhaustion and consequently may present symptoms which vary with the individuality and temperament and occupation of the patient

They include quite commonly a tendency to rapid fatigue, not only ocular but general physical and mental, nervous tension, irritability, making the patient "difficult to live with," vertigo, etc

But the symptom for which advice is most commonly sought is headache, which is recorded as present in 64 cases

The main characteristics of the headache are as follows

- 1 It dates usually from an early period in life, sometimes being represented at the earliest period by cyclical vomiting This excludes later more acute conditions such as sinus trouble, as possible causes The cause must precede the effect
- 2 Its location is commonly the frontal and occipital regions, sometimes the occipital region alone or in association with neck symptoms, rarely the frontal region alone and still more rarely the vertex Pain, stiffness or discomfort of some kind in the back of the neck is recorded in 18 cases, but that certainly understates its frequency It is one of the most constant and characteristic symptoms in these cases and is about as suggestive of muscle imbalance as photophobia is It is certainly far more commonly due to this cause than to accommodative strain It

is often constant and it is not uncommon to see it cease promptly and completely on occlusion of one eye, even when it has been present for years or even from childhood

- 3 Its frequency varies from daily or constant headache to periodical headache of migrainous type with varying intervals of freedom
- 4 Its severity varies from moderate dull headache to pain of the severest type, putting the patient in bed for two or three days at a time, completely incapacitating him from work
- 5 It may be accompanied by nausea and uncontrollable vomiting or be quite free from gastric symptoms Sometimes the gastric symptoms are the most prominent, and the attacks may be called "bilious attacks"
- 6 The time of onset is commonly on waking but may be at any time

The following cases briefly reported exemplify types of this group

CASE 6 Mrs C E C (A7196) Aged 43 Wife of physician Seen December 13, 1929 Sick headache, photophobia and general fatigue Headache began in twentieth year, her first year of training as a nurse, and occurred at every menstrual period and sometimes in between, lasting from 5 00 P.M. or 6 P.M. until next A.M. after breakfast, accompanied by severe nausea and vomiting Sometimes nausea occurred without headache These headaches were unilateral, the pain being most intense in the eyes and back of the neck. Each headache was accompanied by a loss of six or seven pounds in weight. There were also spells of exhaustion without headache lasting three or four hours She had worn glasses for 22 years without any influence on the symptoms, the last examination being one year ago, when no change was made She was wearing R -0.75c 110° L -0.75c 115° approximately an accurate correction Tests for muscle balance showed orthophoria. No hyperphoria could be detected in any part of the field

A prolonged occlusion test (R eye occluded) lasting eleven days revealed a left hyperphoria of 3° and exophoria 7° Prisms correcting 2° of hyperphoria and $4\frac{1}{4}^{\circ}$ of exophoria were added to the refractive correction In August, 1930 she reports herself as much better less headache slight nausea, much less exhaustion and has gained weight. On December 30 she reports no headache between Easter and October some moderate ones lately and has gained 25 pounds April 3 1933 she reports total gain in weight 27 pounds and an occasional headache

Graph 2 shows the gradual manifestation of the deviations

CASE 7 T W D aged 35 years (7635) University professor Asthenopia neurasthenia psychasthenia, photophobia extreme nervous tension Seen in July, 1919 wearing R -0.75c 90° and L -0.62c 50° Approximately accurate Complaining that use of his eyes makes him so nervous all over that he can't do a thing that the last glasses strain his eyes and that he will have to give up his position, if he can't obtain relief. After cycloplegia R accepted -0.25 -0.87c 80° and L -0.25s -0.75c 65° and tests for muscle balance showed left hyperphoria 1° and esophoria 4° A seven day occlusion test resulted in left hyperphoria $2\frac{1}{2}^{\circ}$ and esophoria 16° Partial tenotomies of both interni

however, which may be most plausibly credited with the production of migraine. Although the evidence is scanty, the surgical results are uniform in the relief of the headache by interruption of the afferent or efferent flow of impulses. How the perverted activity of the vegetative nervous system is brought about, resulting in vasomotor unbalance, is unknown. The hypothesis that a perverted hormonal balance is the inciting agent and causes a disordered vegetative nervous system seems to be the most tenable theory at present.

The surgical methods utilized are (1) removal of certain sympathetic ganglia, (2) ablation of some of the vascular plexuses of the sympathetic, (3) occlusion of the middle meningeal artery.

G. D. Dickerson⁸ reports some very encouraging results with the third method enumerated above. In five of six cases typical of migraine, the sixth being somewhat questionable, either cure or definite relief has been produced for varying periods of time.

Riley points out, however, that a final decision as to the permanency of such results should not be reached at the present time, for it is well known that almost any form of radical change in physiology, metabolism or even psychic attitude in a patient may result in a cessation or abatement of migrainous attacks.

THE MENINGES AND CEREBROSPINAL FLUID

In a detailed paper, F. Fremont-Smith⁹ gives the causes of the alterations in the cerebrospinal fluid in meningitis. The increase in pressure is due to several causes, the most important of which are (1) dilatation of the intracranial blood vessels, and (2) mechanical obstruction by the exudate and the inflammatory reaction of the cerebrospinal fluid pathways. Decrease in the osmotic pressure of the blood, increase in the osmotic pressure of the cerebrospinal fluid and edema of the brain may also play a rôle. The cellular exudate comes chiefly from the blood stream and to a lesser extent from the arachnoid cells, it is the usual cellular response to infection.

In meningitis, as in health, the chemical composition of the cerebrospinal fluid depends chiefly on the composition of the blood plasma, the cerebrospinal fluid tending to remain in osmotic equilibrium with the blood. The chief change in composition of the blood plasma in meningitis is a lowering of the chlorides, which is reflected by a parallel fall in cerebrospinal fluid chlorides. A similar fall in cerebrospinal fluid chloride occurs whenever the plasma chlorides are decreased, notably in acute febrile diseases, such as pneumonia, scarlet fever, etc.

Another factor influencing the composition of the cerebrospinal fluid in meningitis is the local breakdown of dextrose as a result of bacterial

and cellular action. This results in a lowering of the dextrose content of the cerebrospinal fluid, which may fall nearly to zero and in an increase in acidity of the cerebrospinal fluid, chiefly due to an increase in lactic acid. Thus, in turn, results in a disturbance of the Donnan membrane-equilibrium and tends to lower the chloride content of the cerebrospinal fluid, bringing it nearer to that of the blood.

In addition, there is a partial breakdown of the impermeability to protein of the membranes separating the plasma from the cerebrospinal fluid. This allows protein to enter the cerebrospinal fluid, raising its protein content, which results in lowering of the cerebrospinal fluid chlorides. As the protein content of the cerebrospinal fluid in meningitis is usually only moderately increased, so that when compared with plasma, the cerebrospinal fluid remains relatively protein-poor, the effect of this increased permeability on the chloride distribution is usually slight and often negligible. Occasionally, however, especially in the presence of sub-arachnoid block, the protein content becomes markedly increased. Under these circumstances, there is also the opportunity for the greatest accumulation of lactic acid. The cerebrospinal fluid chlorides level may then become appreciably closer to that of the plasma. Rarely this combined effect may be quantitatively greater in lowering the cerebrospinal fluid chlorides than the effect of the fall in plasma chlorides.

EFFECT OF SPINAL ANESTHESIA ON CENTRAL NERVOUS SYSTEM

F. G. Lindemulder¹⁰, in a review of the literature and from his own personal observations, points out the sequelae and danger of this method of anesthesia. He found that the most common sequel was pain in the extremities, especially in the legs, but also in the back and, in one instance, the head. In three cases, the pain in the legs continued for several months. Marked muscle tenderness in the extremities also resulted in these three cases.

In one case, in which a sensory level reached the second cervical segments, the patient showed the following: severe headache, neck rigidity, positive Kernig, active tendon reflexes, marked hyperesthesia over the body, Babinski on the left, loss of vibration sense over the ankles, and a loss of the sense of motion and position of the toes. Within 24 hours there was noted a paralysis of the right external rectus muscle. These symptoms lasted for several weeks, and except for the pains in the arms and legs, the patient was asymptomatic at the time of his discharge from the hospital. The spinal fluid was negative after the operation.

In two patients that died several days following the operation, the spinal anesthesia is thought to have been a contributing cause. Necropsy showed in both cases severe urinary tract infection, congestion, edema and degeneration.

MEDICAL PROGRESS

PROGRESS IN NEUROLOGY, 1932

BY ABRAHAM MYERSON, M.D.,* AND JULIUS LOMAN, M.D.*

EPILEPSY

IN last year's "Progress in Neurology", we reviewed briefly Temple Fay's ideas on the production of epileptic convulsions, among which was the theory of deficient water absorption from the subarachnoid space. Stanley Cobb¹ takes issue with this theory. He does not believe that accumulation of fluid, sometimes found in epileptic brains, can occur from "supracortical increase in pressure" resulting in cortical atrophy. Cobb explains that since the flow of cerebrospinal fluid is from the ventricles to the subarachnoid space where it is absorbed, the pressure in the ventricles must be higher than in the subarachnoid space, otherwise there would be no flow. If now obstruction to absorption occurs (arachnoid villi and small venules and capillaries of the subarachnoid space), the flow of fluid will be slowed, but so long as any absorption occurs, the flow will continue and the ventricular pressure will continue to be higher than that in the subarachnoid space. If the obstruction were complete, the flow would cease and the pressure in the subarachnoid space would become equal to that in the ventricles. Cobb points out that there is no known mechanism by which the subarachnoid pressure could become greater than in the ventricles.

Cobb also doubts Fay's statement that water-drinking raises intracranial pressure in epileptics. The remarkable adaptability of the kidneys in maintaining the constancy of the composition and the volume of blood makes one doubt Fay's idea. This is borne out by Fremont-Smith's study of 15 epileptic patients. These were given 1200 cc of water in three hours, the spinal fluid pressure being measured frequently. He found that in only three of the epileptics was there any delay in water excretion and in only one of these three did a convulsion occur.

Cobb believes that although restriction of water, which Fay advocates, may diminish the number of attacks, the direct experiments of Fremont-Smith and also those of Lennox show Fay's assumption as to the influence of water-drinking on the cerebrospinal fluid pressure to be erroneous. Cobb lists 56 clinical cases of fits and discusses their physiological mechanisms. At present, awaiting further research, Cobb reduces the numbers of mechanisms by saying that it seems probable that embryological defect and

tissue destruction act by altering neural conduction. He points out the importance of cerebral anoxemia (this includes 36 of the 56 causes given). Hydration and dehydration probably act through chemical changes. Many drugs and chemicals cause convulsions by some unknown mechanism.

The Treatment of Epilepsy

Meggendorfer² used a combination of phenobarbital and belladonna in 37 cases of epilepsy and found a reduction of 33 per cent in the number of attacks as compared with periods in which only phenobarbital was used.

* Hanns Manitz³ treated 28 epileptic children with a combination of luminal and caffeine in a proportion of two to one and found that better results were obtained in over half the cases than by the use of luminal alone. He believes that the "hypnotic effect" of luminal is neutralized by caffeine and that the vasodilator action of the latter drug helps to counteract convulsions. (Our own clinical experience confirms this and we believe caffeine to be a valuable adjunct to sedative therapy.)

According to the experience of O. Beck⁴, the ketogenic diet does not accomplish more than the other methods of treatment in epilepsy. Moreover, he states that the treatment is not free from harm, for he believes it is possible that a diet deficient in carbohydrates for long periods may result in acute loss of function of the insular apparatus of the pancreas. A contraindication, too, is that the diet is expensive and involves great difficulty, since it has to be given for long periods.

MIGRAINE

In a very long article, Henry Alsop Riley⁵ discusses the various theories of migraine, including the reflex, "central", allergic, duodenal stasis, hypophyseal, toxic, endocrine, vasomotor or vegetative.

The reflex and "central" theories are disregarded as important. Although the allergic, duodenal stasis, and toxic theories may play a rôle in some cases, they leave unexplained the essential mechanism of migraine. The rôle of the glands of internal secretion in the production of migrainous attacks is indicated by the results of ovarian hormonal medication and by other clinical data. There is some evidence that some patients present changes in hormonal balance.

It is the failure of the vasomotor apparatus,

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considerably more intracranial damage than is ordinarily implied by the term concussion and usually a demonstrable linear fracture of either the base or the vault, (3), those with profound unconsciousness or even moribund, (4) those who present the typical syndrome of an extradural clot from meningeal hemorrhage, (5), those with depressed fractures, and (6), those with gunshot wounds. The author discusses the treatment of each group and the complications of head injury, including meningitis, abscess, subdural hematoma, and pneumocephalus.

Subdural Hematoma

Papers on this subject by Abraham Kaplan¹⁵, H W Fleming and O W Jones, Jr,¹⁶ and W J Gardner¹⁷ point out the following salient features

1 The condition is frequently unrecognized, although more common than middle meningeal hemorrhage and frequently follows insignificant head injuries

2 The interval between the injury and onset of symptoms varies from a few days to many months

3 There is no typical clinical picture. Misleading and bizarre pyramidal tract signs may be noted, such as ipsilateral hemiplegia. According to Kaplan, the most characteristic symptom of chronic subdural hematoma is a peculiar lethargic state which seems to alternate from drowsiness to coma, with periods of alertness and surprising response occurring within 24 hours or several days. Early symptoms, state Fleming and Jones, often simulate those ascribed to posttraumatic psychoses, and when followed by intracranial signs of general and local pressure or irritative phenomena are most significant. The spinal fluid pressure is usually definitely but moderately increased and as a rule, is clear, occasionally, it is xanthochromic.

4 Operation, if done early enough, will usually be followed by recovery.

VASCULAR AFFECTIONS

Spontaneous Subarachnoid Hemorrhage

I Strauss, J H Globus and S W Ginsburg¹⁸ give a long and well-illustrated report of 34 cases describing this syndrome. These authors point out that it is a disease entity that should be clearly understood, not only by the neurologist but by the interne who is more likely to see the condition in the acute stage.

The syndrome is characterized by a short prodromal stage, during which headache, dizziness, nausea, and rigidity of the neck and spine are the outstanding symptoms. This is followed by an abrupt and explosive onset of the acute stage with violent headache, impaired consciousness and occasionally by convulsions. The usual signs of meningeal irritation and of increased intracranial pressure are found, the cerebrospinal fluid now being usually bloody. The

clinical course may be short or last several weeks, with or without recurrences of bleeding.

It is important to differentiate this type of bleeding and other forms of intracranial hemorrhage for, once recognized, the treatment is very definite: repeated lumbar punctures to relieve the symptoms of increased intracranial pressure. The prognosis, though always grave, is not hopeless, recoveries are frequent.

Brain Changes in Malignant Endocarditis

I B Diamond¹⁹ found from the examination of 12 brains from cases of malignant endocarditis that changes in this organ are frequent. The lesions may be either circumscribed or diffuse, the former usually being in the form of nodules, the latter in the form of meningoencephalitis. These changes are manifestations of a defense reaction against an infection or intoxication.

Spinal Fluid in Arterial Hypertension

Samuel A. Shelburne, Daniel Blain and James P O'Hare²⁰ made a study of 50 patients showing arterial hypertension. In 21 patients there was increased intracranial pressure, nearly all of them having edema of the optic discs. Although it was more common to find renal disease associated with these changes, they were also found in the presence of normal renal function. The authors could find no cause for the increased intracranial pressure in 50 per cent of the cases.

Francis C Grant²¹ describes five cases with the syndrome of malignant hypertension characterized by headache, vomiting, and choked discs. In two cases there was such definite neurological findings that a diagnosis of neoplasm was made. Operation, however, failed to reveal a tumor. In none of the cases was there sufficient evidence of renal disease to account for the hypertension.

The Encephalitides

The pathogenesis and the classification of disseminated encephalitides and the demyelinating diseases are still in a state of great confusion. Thus, Rivers in an article on filterable viruses quotes several workers who consider such diseases as multiple sclerosis, as a degenerative rather than inflammatory condition while other investigators consider them as due either to single or combined infections. Levaditi and Pette insist that all the demyelinating diseases are caused by filterable viruses.

Such differences of opinion as to etiology together with difficulties of classification may be seen by reading papers on this subject by Rivers²², Gill and Richter²³, Bielschowsky and Maas²⁴, Barrera²⁵ and O Sager and D Gregor-esar²⁶.

Charles F McKhann²⁷ gives an instructive picture of lead encephalitis in children. This author states that lead produces severe cerebral involvement, probably due to marked edema,

tions in the brain and cord, attributable to the anesthesia

The author advances the theory that all spinal anesthetics produce an acute myelitis which usually lasts a few hours and may leave the patient with complaints of pain and paralysis for a period, but at times there may be a permanent involvement of the nervous system, both clinically and pathologically. That spinal anesthesia may cause definite organic changes in the cord and membrane is pointed out by Loyal Davis, Hale Haven, J H Givens and John Emmett⁹ who injected the common solutions in use in the dural sacs of dogs. They found (1) a varying degree of inflammatory reaction in the leptomeninges, (2) passive changes in the ganglion cells of the grey matter of the cord, similar to those seen in so called wallerian degeneration, (3) swelling and fragmentation of the axis-cylinders, (4) signs of degenerative changes in the fibre tracts of the cord. Although the first three of these changes were not pronounced and were usually seen to disappear gradually, the inflammatory changes in the lepto-meninges were constantly present

TRAUMATIC AFFECTIONS

S Bernard Wortis¹⁰ observed the following changes after producing experimental cerebral lacerations in cats (1) aseptic lacerations of the brain without removal of the products of trauma in the cat results in ventricular distortion due to (a) meningocerebral adhesions and (b) contracting cerebral cicatrix, (2) head trauma resulting in the escape of blood into the cerebrospinal fluid often gives rise to mild bilateral ventricular dilatation in the absence of grossly demonstrable meningocerebral adhesions or a cerebral scar, (3) aseptic laceration of the brain and head trauma resulting in fracture of the skull, increase the animal's sensitiveness to a standard convulsant over the period of observation

Mechanisms in Brain Trauma

According to his clinical observations, N W Winkleman¹¹ states that blood in the subarachnoid space acts as an irritant and produces the clinical picture of a meningeal inflammation and pathologically the so-called aseptic meningitis. Because of this, the author advises frequent spinal drainage to prevent such a reaction in the meninges. Spinal drainage in such cases serves to directly relieve the symptoms.

Subarachnoid bleeding may secondarily result in a blockage to the spinal fluid absorption through the pacchionian filters and a damming back of the fluid over the vertex. If this continues, atrophy of the convolutions will result. (The present authors regard these views as somewhat extreme, although agreeing that lumbar puncture in moderation is valuable.)

Winkleman advises caution in making the

diagnosis of posttraumatic neurosis, even in the absence of all clinical signs of involvement of the brain. Many so called causes of neurosis, following head trauma, may be shown to have an organic basis by encephalographic studies.

Encephalographic Observations on Head Injuries

E D Friedman¹² reports that in a group of head cases, showing either focal or generalized cerebral symptoms, all but one showed definite changes in the encephalogram: dilatation of the ventricles, considerable accumulation of air on the convexity of the brain and migration of the ventricular system toward the site of the lesion. These deviations from the normal were found either separately or in combination. Friedman states that these encephalographic observations were so uniformly abnormal that they are suggestive of an organic basis for some of the symptoms in the posttraumatic state, not only in those cases in which focal signs are present, but also in those cases in which general symptoms are complained of. Encephalography thus offers a valuable means of differentiating organic and functional syndromes.

Evaluation of Evidence in Head Injury Cases

Foster Kennedy¹³ offers the following criteria of head injury sufficient to produce organic changes in the brain:

A Absolute criteria

- (1) Roentgen evidence—skull fracture
- (2) Bloody spinal fluid
- (3) Bleeding from the orifices, especially the ears
- (4) Focal cerebral palsies

B Presumptive criteria in the order of their importance

- (5) Convulsive states proved to be posttraumatic
- (6) Ventricular distortion, proved to be posttraumatic
- (7) History of prolonged unconsciousness
- (8) History of adequate trauma with especial consideration to the occurrence of vomiting following the injury

If headache and dizziness persist for more than four months in a man under 60 unassociated with the first seven signs listed above, they are to be regarded as "suggested neuroses" unfounded in structural change.

Head Injuries and their Complications

Most cases of head injury, Gilbert Horrax¹⁴ finds, fall into the following groups: (1), those spoken of as "concussion," in which loss of consciousness is brief and with or without fracture of the skull, (2), those in which there is

MULTIPLE SCLEROSIS

Etiological Factors

J S Collier³⁶ discusses the household incidence as opposed to the familial incidence of this disease. Because he had noted on three different occasions that two young male patients entirely unrelated, but who had been brought up in the same environment developed the ailment, he suggests a common infection in the three pairs. On the other hand, all cases cannot be explained in this way, for the author has also observed the condition in a mother and two daughters. The mother died when the daughters were infants, and furthermore, for 15 years prior to the onset of the symptoms in the younger one, the girls had not seen each other. This, of course, argues for a familial incidence.

Another possible etiological factor in multiple sclerosis has been suggested by R S Allison³⁷. He has observed from cases occurring in Ireland that the only frequent feature in the large majority of cases was the fact that they obtained their drinking water from spring wells. There also seemed to be a relationship between multiple sclerosis and goitre because of similar geographical distribution of the two diseases, possibly the link between the two diseases is drinking water. (Both these theories are interesting but to the reviewers seem hardly convincing.)

Therapy in Multiple Sclerosis

Not only does fever therapy exaggerate the symptoms of this disease, but, states J C Muscio Fournier³⁸, injections of typhoid vaccine cause the appearance of added symptoms, such as ptosis, diplopia, hyperalgesia, ankle clonus, and diminished acuity of vision. The author suggests because of these observations that vaccine injections may settle a diagnosis in early cases, in which there are no objective signs and it is impossible to differentiate disseminated sclerosis and hysteria.

Richard M. Brickner³⁹ reports favorable results in 40 cases of multiple sclerosis with quinine. The usual dose given was five grains three times a day. In the majority of instances, improvement was noted in those symptoms which had been present for not more than two years. The author points out that relapses should not cause the treatment to be abandoned, since in no case did the relapse last longer than from four to six weeks when treatment was continued. The quinine should be continued indefinitely to maintain relief of symptoms. If cinchonism develops the treatment should be temporarily interrupted and then quinine given in smaller doses. Many symptoms were noted to regress, particularly spasticity.

PERNICIOUS ANEMIA

Neurological Manifestations

In a series of 515 cases observed over a period of 18 years at the Peter Bent Brigham Hospital, Richard H Young⁴⁰ reports the following neurological features of pernicious anemia. Twenty per cent of the cases showed marked cord changes as exhibited by reflex changes and ataxia. Four and five-tenths per cent showed psychotic trends of varying nature, including acute deliriums, depressions, paranoid states, and memory and disposition changes. Changes in disposition were often associated with the progress of remissions. Autopsies in the cases showing psychotic changes revealed several pathological alterations including a chronic pachymeningitis and leptomeningitis in one case, and a subdural clot in another case. Other neurological features presented were nystagmus, scanning or staccato speech, dysarthria associated with aphasia, a sixth nerve palsy and two cases of seventh nerve palsy.

Liver Therapy

From their experience with the effect of liver therapy on the neurological manifestations of pernicious anemia, Benjamin M Baker, Jr., James Bordley, III, and Warfield T Longcope⁴¹ point out the importance of the observation stressed by other investigators, that before expecting marked improvement, large amounts of liver must be administered over long periods. Thus, in cases treated for less than six months, improvement occurred in 31.25 per cent of the neurological signs and symptoms, in those treated for more than six months 55.17 per cent of the signs were improved, and in those treated over ten months, 58.93 per cent of the signs of combined degeneration were favorably influenced.

The authors discuss the possible implication of vitamin deficiency in the production of some of the symptoms and signs which may be dependent upon changes in the peripheral nerves.

THE PERIPHERAL NERVES

Peripheral Paralysis Following Serum Treatment

Several new cases of peripheral nerve involvement following injections of serum and antitoxin continue to be reported.

Forest Young⁴² reports the case of a man, aged 40, who developed serum sickness three days after an injection of prophylactic tetanus antitoxin. Three days later he complained of pain in the arms, in the back, and legs. Seven days after the onset of the serum sickness, he developed weakness of the right arm with diminished sensibility. Five weeks later the axillary nerve was paralyzed and showed a complete reaction of degeneration, atrophy of the

which may, if the children survive, leave permanent neurological disorders. Peripheral neuritis is less common in children than in adults. In the acute stage, treatment must be directed toward the relief of the greatly increased intracranial tension.

Encephalitis from Stovarsol

According to Reiter²⁸, stovarsol, an arsenical compound, used in the treatment of Vincent's angina, may cause a severe dermatitis, fatal agranulocytosis, and hemorrhagic encephalitis. Reiter describes a case of a man who received 55 grams of the drug in seven days. He developed a rash, convulsions, left facial paralysis, loss of knee jerks, athetoid movements, and stupor. He was given intravenous glucose and insulin, and recovered.

NEUROSYPHILIS

Histopathology of Therapeutic Malaria

In a very detailed histologic study of the tissue changes in a syphilitic (not paretic) patient who died while under treatment for malaria, Walter L. Breutsch²⁹ concludes that one of the many factors accounting for the beneficial effects of therapeutic malaria is the activation of the reticulo-endothelial system accompanied by new formation of macrophagic tissue. In the nervous system, the reticulo-endothelial response is greatest in the leptomeninges and to a lesser extent in the perivascular spaces of the large vessels, in the white matter in the striatum and in the pons. Activation of the reticulo-endothelial system elsewhere in the body occurs in addition to an increased response in the undifferentiated embryonic mesenchymal cells. (Abnormal cells belonging to the reticulo-endothelial system have been found in the blood of general paretics not treated with malaria by Dr. William Dameshek working in the laboratory of the Boston State Hospital.)

The Treatment of Neurosyphilis

H. C. Solomon³⁰ makes some very pointed and valuable statements as to the management of neurosyphilis. He stresses the great importance of considering every case of syphilis a potential prospect for the development of neurosyphilis. This calls for a careful neurological survey of the infected patient from the earliest to the latest period of the disease. Once there is evidence of central nervous system involvement, the emphasis must be laid on the type of therapy that will produce serological improvement. If in the early stages of the disease, arsphenamine, bismuth, and mercury have been found to be ineffective in producing a serological cure, one must turn to either tryparsamide or fever therapy or a combination of the two. If this is adhered to, there is great likelihood that the central nervous system involvement may be eradicated, or at least held in check.

Although tryparsamide and malaria are considered to be the most beneficial remedies in general paresis, there is a difference of opinion among neurologists as to the order in which type of therapy be given. According to Caldwell³¹, the most effective method is the course of tryparsamide before the induction of the pyrexia. In this way, there is a clearing up in the cortical spirochetosis and an improvement in the general condition, so that the patient is able to withstand the exhaustion of the fever.

Sulphur in General Paresis

Injectations of sulfosin give as good results in this type of neurosyphilis as does malaria, according to experience in Denmark for the past five years. Knud Schroeder³², who reports the results of the treatment, states that sulfosin gives a maximal therapeutic effect with minimal risks to the patient. It is, however, difficult to compare the durability of its good effects with those of malarial treatment.

THE SPINAL CORD

Spinal Epidural Abscess

Several cases of abscesses of the spinal space have been reported this past year. Bellerose and R. Amyot³³ relate the case of a woman, 39 years old, who was being treated for multiple furunculosis of the back of her neck. She later developed a chill, fever, and severe costal pain. Several days later, she had a urinary culture in urination, followed in two days by a diagnosis of transverse myelitis. Lumbar puncture showed a xanthochromic fluid which coagulated immediately. Laminectomy showed a collection of thick yellow pus in the epidural space between the fifth thoracic vertebra and the sixth. This was evacuated. The paraplegia persisted. The patient later developed new abscesses and died.

S. S. Allen and E. A. Kahn³⁴ report two cases of epidural abscess. In the first instance, following recovery from appendicitis, a phrenic abscess and septicemia, a man developed signs of a myelitis with signs of block at the third thoracic vertebra. In the second case, a girl developed epidural suppuration at the fourth thoracic region. This occurred following a furuncle. Death occurred in both cases, although surgery was done. In the third case, the abscess developed in a man with a furuncle on the back of his neck. Laminectomy disclosed a collection of pus in the epidural space between the seventh and eighth thoracic segments. A large amount of pus which was evacuated. The patient recovered, although he remained paralytic.

W. J. Mixer and R. H. Smithwick³⁵ report ten cases of acute spinal epidural abscesses. In seven of these, following other infections, in five of which spinal osteomyelitis was associated with the abscess. Of eight who had laminectomy, three recovered.

the autonomic nervous system. This conception opens new horizons to the physiologist for it allows him to visualize more adequately than ever before the integrated functions of the organism as a whole.

Muscular Dystrophy and Myasthenia Gravis

Interesting chemical studies with respect to creatin have been made and therapeutic effects of glycine in these two conditions have been observed by several workers. A. T. Milhorat, F. Tschner and K. Thomas²² have followed the course of three cases of progressive muscular dystrophy and three cases of pseudo-hypertrophic muscular dystrophy in which the daily ingestion of glycine caused a definite increase in the excretion of creatin. After several weeks a definite clinical improvement associated with a decrease in the excretion of creatin occurred.

W. M. Boothby²³ finds that even on a creatin-free diet patients with progressive muscular dystrophy continue to excrete creatin. Four patients, who were put on a normal diet showed creatin nitrogen equal to or in excess of the preformed creatinin nitrogen.

Patients with myasthenia gravis, on the other hand excrete little or no creatin. The author reports six cases of myasthenia gravis which were benefited by glycine. One of the patients, who previous to treatment could walk only two blocks and had such marked weakness of his arms and shoulders that he could hardly shave, marked ptosis of the eyelids and difficulty in swallowing showed improvement of these symptoms after taking 15 grams of glycine twice daily for several weeks. Another patient made a startling improvement also. A third made some improvement. Therapy on the other three patients had to be discontinued because of an insufficient supply of glycine.

L. Remen²⁴ has observed two cases of myasthenia gravis which were given glycine in doses of ten grams for two months. Definite improvement occurred. During treatment, the creatin, which had been considerable disappeared from the urine.

The only treatment of any value for muscular dystrophy according to G. Goralewski and E. Engel²⁵ is hypodermic injections on alternating days of adrenalin and pilocarpin of each 2 cc of a one per cent solution. They give the report of one case that was given 50 injections. Careful measurements of the volume and the strength of certain muscles were made before and after treatment. (The evidence adduced is not convincing.)

Muscular improvement was observed by Anna Leiter²⁶ in three cases of dystrophy that were given 0.03 cc adrenalin of 1:1000 solution intravenously, the dose gradually being increased to 15 cc. Thirty doses were given daily or every other day. The blood showed a rise in the previously low sugar content. (The reviewer's comment is as above.)

Etiology of Peptic Ulcer

The implication of neurogenic factors in the

etiology of peptic ulcer is stressed by Harvey Cushing.²⁷ He cites three cases in which perforation of acute ulcers of respectively the stomach, duodenum and esophagus occurred soon after operation for cerebellar tumor. Cushing also discusses two cases of chronic duodenal ulcer in one case of which cerebellar tumor was present, and in the other a tumor of the third ventricle was found. He cites also two cases of mucosal erosions associated with cerebellar tumor and olfactory groove meningioma respectively. Cushing in pointing out the psychic aspect of the ulcer problem states that it is common knowledge that "highly strung persons are particularly susceptible to nervous indigestion with associated ulcer. That mental and physical rest has a definite beneficial effect on the course of the ulcer and often tends to heal them. Furthermore symptoms often are prone to recur when the patient returns to his former habits."

In attempting to find a reasonable explanation for the etiology of ulcer Cushing cites the fact that experimental lesions made anywhere along the course of the splanchnic tracts from the anterior hypothalamus to the vagal centre are prone to cause gastric erosions. In the light of such evidence it may well be that the interogram now recognized as a highly important centre may be so adversely affected by psychic influences arising in the so-called vagotonic individual as to finally result in the production of ulceration of the upper alimentary canal.

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deltoid was also present. Only slight motion of the deltoid returned after three months of massage and abduction in a splint.

George Wilson and Samuel B. Hadden⁴³ report six cases of involvement of the circumflex nerve, with slighter involvement of other nerves, following the injection in four patients of tetanus antitoxin and of diphtheria antitoxin in two cases. Following inoculation against scarlet fever, Alfred Gordon⁴⁴ observed three cases of musculo-spiral paralysis and one case of facial palsy. These patients all recovered in from four to seven weeks.

Arsenic and Lead Neuritis

After making chemical studies in 33 cases of neuritis in which lead or arsenic was found, Walter D. Sheldon, John B. Doyle and Arnold E. Osterberg⁴⁵ make some very interesting observations. They find that lead is retained in the body much longer than arsenic. The amounts of these substances bear no particular relationship to the clinical condition. Patients with large amounts of arsenic in the urine may exhibit no signs of arsenical poisoning and may indicate only that the intake has been recent. On the other hand, the absence of the metal from the urine and its presence in the hair may indicate that it has been stored up for a long time and yet cause toxic symptoms. The same may hold in cases of lead poisoning. The authors cite cases exemplifying the above phenomena.

Multiple Neuritis from Apiol

A multiple neuritis resembling Jamaica ginger neuritis has been found to result from the administration of apiol, a substance used as an abortifacient. According to Karl Hellmuth and Richard Grun⁴⁶, the toxic effect is not due to the apiol itself but to admixture of triorthocresolphosphoric ester. This substance is also the cause of Jamaica ginger paralysis. The above authors report a case of multiple neuritis resulting from ingestion of large amounts of apiol to induce abortion.

Emil Rechnitz⁴⁷ reports six cases of apiol multiple neuritis occurring in Yugoslavia. The symptoms in each case were alike, first paresthesia, then paralysis of hands and feet. Usually the knee jerks were preserved, the ankle jerks lost, sensation remained intact.

Another case is reported by Henry Roger⁴⁸. In this instance, that of a young woman, all four extremities were paralyzed. A severe case of multiple neuritis is reported by H. Jagdhold⁴⁹. The patient, a woman of 31, had taken nine capsules of apiol for five days for the purpose of inducing abortion.

Etiology of Polyneuritis

I. S. Wechsler⁵⁰ points out the importance of food deficiencies in the production of polyneuri-

tis. From his observations of clinical material, he concludes that many cases of obscure origin are probably neither toxic nor infectious in nature, but more likely are deficiency syndromes, that is, belonging to the group of avitaminosis. Thus, one can often elicit a history of prolonged loss of appetite, diarrhea or vomiting, absence of free hydrochloric acid, or evidence of gastrointestinal or hepatic disease.

In many cases of polyneuritis, hitherto regarded as caused solely by a specific factor, such as alcohol or the metals, one often finds an additional factor of avitaminosis which may possibly be of more importance than the so-called specific cause. This view may explain why the polyneuritis develops in certain of the patients although all are exposed to the same toxin. In any case, one should apply the therapeutic test of giving diet rich in vitamins even though a specific cause may not be found. Although as yet, there is no evidence pointing to which vitamin is involved in the obscure cases or in cases in which avitaminosis seems to play an important part, there is some experimental evidence that absence of vitamin A and possibly also of C and D can lead to degenerative changes in the spinal cord, the roots and the nerves and furthermore, that their presence will prevent degeneration by toxins which sometimes affect the nervous system.

The Vegetative Nervous System

J. F. Fulton⁵¹, the physiologist, gives an excellent résumé of our present knowledge of the hypothalamic region. Not only does the hypothalamus influence the heart and intestinal tract, but it regulates carbohydrate, fat, and water metabolism. Furthermore, heat regulation, vasomotor control, sexual function and the activity of all other organs innervated by the autonomic nervous system are, to some extent, controlled by this area. The real significance of this intimate relationship with so many bodily functions has been pointed out by Cannon. The sympathetic centre of the autonomic system located in the posterior hypothalamus, brings about those adjustments essential for escape and combat, or what may be called adjustments of a spendthrift character: elevation of the temperature, acceleration of the heart, and mobilization of the energy reserves. On the other hand, activity of the parasympathetic division, calls forth a defense mechanism of conservative character. Here the temperature falls, the pupils contract, the glycogen reserves of the body become replenished, and gastro intestinal activity is increased, and food-stuffs are made available to the organism.

The author points out that it is evident more and more that the remarkable constancy of the internal milieu of the body, temperature, salt, hydrogen-ion concentration, etc., is controlled mainly if not entirely by the various centres of

CASE RECORDS
of the
MASSACHUSETTS GENERAL
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F M PAINTER, A.B. ASSISTANT EDITOR

CASE 20061

PRESENTATION OF CASE

A retired American banker seventy years old entered complaining of vomiting of two weeks' duration

The patient was first seen as a private patient of Dr Wyman Richardson's about eighteen months before admission. At that time he complained of lower abdominal pain and gas of three months' duration. This pain was associated with a severe mid-dorsal pain and produced a steady discomfort. The pain was often brought on by exertion. He occasionally complained of heartburn. His bowels were regular. He had lost five pounds during the past six months. There had been no bloody or tarry stools. Physical examination was entirely negative except for a slightly distended abdomen and a little resistance in the left lower quadrant. There were bilateral inguinal herniae. A gastro-intestinal series showed a fleck ulcer of the duodenum without evidence of obstruction or appreciable deformity. The esophagus was normal. He was put on a six-meal bland diet and tincture of belladonna ten drops three times a day. His pain disappeared for a while, but recurred with dietary indiscretions. Five months before admission he was having a great deal of pain. He was very much depressed over his financial situation. He developed slight edema of the ankles. He was warned to keep on his diet.

Two weeks before admission he suddenly noticed a sharp pain under the sternum associated with discomfort upon swallowing. The pain remained localized under the sternum and did not radiate. It became so severe that he was afraid to swallow, although he had been on a liquid diet for the past year. Shortly after the onset of pain he began to vomit after one or two swallows of liquid food. The vomitus or probably the regurgitated food was frothy but never curdled. The vomiting occurred sometimes immediately after swallowing and at other times as long as five to ten minutes later. The pain on swallowing and the vomiting persisted to the day of admission. There was no history of hematemesis or dysphagia at any other time previous to this. His bowel habits were normal. There were no bloody or tarry stools. During the past six months he had lost

strength and about ten or twelve pounds in weight.

His marital, family and past histories are irrelevant.

Physical examination showed a thin, somewhat pale old man with dry, wrinkled skin and evidence of dehydration and weight loss. The teeth were false. There was a moderate dorsal kyphosis. His chest was hyperresonant to percussion. The expansion was somewhat limited. The heart sounds were very faintly audible. The blood pressure was 120/80. There were bilateral inguinal herniae.

Examination of the urine was negative except for a few hyaline casts. The blood showed a red cell count of 5,050,000 with a hemoglobin of 85 per cent, a white cell count of 6,900, and 63 per cent polymorphonuclears. The stools were negative.

A gastro-intestinal series showed almost complete obstruction in the esophagus at the level of the ninth dorsal vertebra. The aorta crossed the midline at the site of the obstruction in the esophagus but did not appear dilated. There was also probable calcification in the aortic cusps without hypertrophy of the heart. During the first five or ten minutes of the observation no barium passed through the point of obstruction. Later however when the patient had drunk as much water as possible a thin stream of barium passed the point of obstruction. The esophagus was quite smooth and conical down to the point of obstruction. There was no evidence of tumor growing into the esophagus or ulceration at the site of stricture. There was an orange-sized herniation of the stomach through the diaphragm.

Two days after admission an adult sized esophagoscope was passed about twelve inches and almost complete stenosis of the esophagus was encountered. Not even a small bronchial bougie could be passed through this stricture. The posterior esophageal wall just above the stricture bled very easily but no outcropping could be seen.

The following day a Witzel gastrostomy was performed under local anesthesia. The next morning the patient was disoriented. He became comatose during the day. Numerous tracheal râles were heard throughout both lungs. He died soon afterwards.

CLINICAL DISCUSSION

DR TRACY B MALLORY Dr Richardson, have you anything to add to the history?

DR WYMAN RICHARDSON I think it is pretty accurate from my point of view. I would say this. He was a very difficult patient to get an accurate history from. His symptoms would vary from visit to visit, depending a good deal on how he happened to feel on that particular day. I do not think there is anything else that I can add to the history.

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MOTHERS DAY

Mother's Day May 13th, is to be observed by women's clubs, men's clubs, medical societies, chambers of commerce and other professional and civic groups who will join in community efforts throughout the nation to Make Motherhood Safe for Mothers. This announcement is made by Mrs. Shepard Krech, President of the Maternity Centre Association, New York City.

"An important step forward is to be taken this year," states Mrs. Krech. "In three previous Mothers Day Campaigns, the effort was to arouse the public to the importance of the fact that two-thirds of the maternity deaths are preventable that 10,000 of the 16,000 women who annually die in childbirth could be saved. The next move, which is to be taken this year, is to do something quite specific and definite about it, with groups working in every community."

Mrs. Krech stated that specific changes cannot be made to improve conditions until people study their own local maternity facilities and determine just what is needed. She indicated that the phases requiring attention may differ widely in various communities.

"Blank appraisal forms," added Mrs. Krech, "are available by the use of these any group of persons may conduct an investigation into the adequacy of what their own town or county is doing for mothers. Such questions as these are to be answered: 'Number of maternity beds?'—'Total number of births in the

last year?'—'Number of deaths in the last year?'—'Is organized prenatal nursing service provided?'—'Is your hospital approved by the American College of Surgeons?'

"There has been a great deal of sentiment surrounding Mother's Day during the time that it has been observed in this country," said Mrs. Krech. "In the last few years there has been a successful effort to direct this fine feeling toward the important subject of saving mothers from unnecessary death. But emotion alone is not enough. We must have facts, pertinent facts, local facts so that groups in every community may work with their own physicians, health officers, nursing associations and hospital authorities to alter those factors in the situation which are a barrier to safe motherhood."

"Only by an appraisal of maternity facilities in every community, and study of their quality, can the great step forward be taken. These blanks are available free. Prizes are to be awarded those groups which have the highest rating for making a thoroughgoing survey and presenting a plan for improvement based upon that survey. Programs for club meetings are also available without charge as well as publicity material for local Mother's Day Campaigns designed to direct the sentiments surrounding this occasion into channels that will be productive of results in terms of human lives saved."

The Maternity Centre Association is a voluntary organization supported by private contribution. The address is 1 East 57th Street, New York City.

genital lesion and not likely to be acquired. These herniae through the esophageal meatus occur in people past middle life. They are quite common. It does not seem at all likely that the length of the esophagus has anything to do with it.

DR MALLORY: What do you think about it, Dr Mosher?

DR HARRIS P MOSHER: My first guess as to the pathologic condition would be carcinoma, my second ulcer.

As for the short esophagus, I see very few of them. The cases all come over here, but the literature of late—I have in mind the *British Journal of Laryngology*—shows that the short esophagus is not uncommon in children. The article I refer to reported five or six cases. I have always been in doubt about biopsies of the mucous membrane of the esophagus as being sure proof of misplaced gastric mucosa.

DR MALLORY: Do you know anything about that, Dr Bremer?

DR J L BREMER: No, but it occurs to me that you are stating that a certain portion is a stomach because it has gastric mucosa. We do not know at all what makes gastric mucosa grow in one part, esophagus grow in another part of the tube and intestine in another. I do not know why we speak of the tube as esophagus or stomach merely on account of the type of mucosa. I wonder if there was not an irregularity in the laying down of the mucosa in the lower part and if it was not really esophagus instead of stomach.

DR CHURCHILL: Of course the short esophagus theory has been advanced as a reason for not operating on hernia of the esophageal orifice. In the ones we have seen at operation the stomach comes down out of the hernial pouch and the cardiac orifice is in the normal place. We have not seen any instance of the so-called short esophaguses at operation.

DR RICHARDSON: I may say that clinically when I first saw the patient I thought he had carcinoma somewhere and was reluctant to accept a diagnosis of duodenal ulcer. After the x-ray diagnosis however the symptoms became much more typical of it.

His history is divided into three periods, the first one when he did well on ulcer treatment, the second one, eight months ago, when he did poorly on every type of ulcer treatment I could think of, and where I again thought there was some process other than ulcer to account for the symptoms. There began then to be a prominence of the mid-dorsal pain which he complained of in the beginning. Then finally and suddenly, at least to me suddenly, came the symptoms of esophageal obstruction which did not appear until about two weeks before I saw him and perhaps three weeks before his entry to the hospital. Then I thought in spite of

the x-ray findings that he had carcinoma of the esophagus.

DR D CAMPBELL SMITH: May I say a word? I esophagoscoped this patient. The findings were typical of a healed ulcer of the esophagus about two inches above the cardiac, and I should be very much surprised if there was any malignancy in this region. The esophagus was very much closed down and it was impossible even to get a bronchial bougie through the constriction. There was slight bleeding of the posterior wall which gave me the idea that there might be slight activity of the ulcer. The late Dr Morrison had a large series of cases of hernia of the stomach along the side of the esophagus and he promised from year to year to publish them but never did.

I should like to ask Dr Hampton whether the patient was sitting down or standing.

DR HAMPTON: He was standing, and no barium passed through the esophagus for the first five or ten minutes. Then we added as much water as he could drink. You can see the level of the barium where it is in contact with the water.

CLINICAL DIAGNOSES

Ulcers of the esophagus (obstructing) and of the duodenum
Diaphragmatic hernia
Bronchopneumonia

ANATOMIC DIAGNOSES

Stricture of the esophagus, probably healed ulcer
Diaphragmatic hernia
Penetrating ulcer of the duodenum
Chronic gastritis
Acute mediastinitis

PATHOLOGIC DISCUSSION

DR TRACY B MALLORY: The postmortem examination showed a marked degree of stricture of the esophagus, the lumen being narrowed to two millimeters in diameter at the most marked point. Above that area the esophagus was slightly dilated. There was nothing grossly to suggest malignancy, and microscopic examination completely rules it out. The entire esophageal wall shows a marked chronic inflammatory process with a great deal of scarring of the submucosa. The epithelium has entirely disappeared so that I do not think that histologically it is possible to say whether or not this ulcer occurred in an island of gastric epithelium.

In addition there was a mediastinitis as a terminal infection, though no area of perforation in the esophagus could be demonstrated.

The duodenum showed a typical deep penetrating ulcer on its posterior wall at the point where it had been seen by x-ray. It had burrowed well into the head of the pancreas, miss-

DR AUBREY O HAMPTON When this man came in the first time I found a duodenal ulcer and apparently did not look at this film at all, because here is a perfectly obvious hernia of the stomach through the diaphragm. I probably dictated the notes from the fluoroscopic examination alone, and the hernia may not have been present during that examination. I do not know whether that is the duodenal ulcer or not, I think it is. He had nothing at that examination that would indicate any delay in his esophagus. He drank the usual quantity of barium rapidly and I did not see any reason to suspect the lesion in the esophagus.

At this examination, fifteen months later, he had almost complete obstruction of the esophagus. This lesion was undoubtedly in the region of the cardiac sphincter. Here is a much better filling of the portions of the stomach above the diaphragm. We thought that the lesion was too smooth and conical for an ordinary carcinoma, and since it was in the region of the sphincter, an ulcer or cardiospasm would produce the picture.

Since he had an ulcer of the duodenum I think we spent most of our time trying to find an ulcer in the esophagus, but we could not find it. This comma-like shadow in the region of the sphincter of the esophagus is supposed to be normal.

We did see some calcification in and around the heart and aorta. That interested us, but I was afraid to write it in the record. I think it pulsated like an aortic valve, but I could not see it very plainly and there were other shadows around it, so I did not have the courage to put it into the record.

DR EDWARD D CHURCHILL Do you call this a thoracic stomach, or a diaphragmatic hernia?

DR HAMPTON I should say it is an ordinary diaphragmatic hernia of the stomach.

DR CHURCHILL With a short esophagus?

DR HAMPTON When you diagnose a short esophagus you are dealing with something that is very rare. In this case we have been trying to explain the shortening of the esophagus as contracture secondary to ulcer. I do not know whether that is too theoretical or not. We know that the cardiac orifice of the diaphragm is often large and relaxed in elderly people.

DR MALLORY I will ask Dr Churchill to discuss this case.

DR CHURCHILL This combination of hernia through the esophageal orifice plus the obstruction in the cardiac end of the stomach is a new one to me. It brings up a point upon which a good many radiologists seem to be in disagreement, whether most of the so-called hernias through the esophageal orifice are due to a short esophagus and the condition should be called thoracic stomach, or whether the lower end of the esophagus is in the normal place within the cardiac end of the stomach expanding upward through the diaphragm.

Of course, speaking on the basis of statistics, esophageal obstruction of less than eighteen months' duration coming out of a clear sky in a man of seventy means carcinoma. That diagnosis must be held in favor despite the negative evidence from esophagoscopy and the information of the X-Ray Department to the contrary. However, with the short esophagus it suggests that the possibility of ulcer might be very real, and we know that herniation of the stomach through the diaphragm is associated with erosions of the mucosa. Dr Bock has shown it to be the cause of constant loss of blood in the stools leading to secondary anemia. There was no secondary anemia in this case, I take it. There is no positive guaiac recorded in the stool examination, so we have no evidence that he is losing any blood. The differential diagnosis must rest between an ulcer in the region of the cardia involving the stomach and esophagus with a chronic stricture, and a carcinoma. Sticking to our numerical law of chances I should favor carcinoma, despite the evidence to the contrary.

I may say that this man seems especially constructed for an operation on the lower end of the esophagus. What we have been trying to do is to resect the carcinoma and bring the stomach up into the retropleural space, but in this case it is already up there so resection might be a relatively simple thing.

Why he died I do not know. We have not enough data. I think the gastrostomy might have been delayed a little. Esophagoscopy one day and gastrostomy the next is a strenuous sequence for a man of seventy in an emaciated condition. I think these patients should be prepared with intravenous glucose and intravenous saline, and the less done at one time the better. Perhaps the gastrostomy might well have been done before the esophagoscopy. I should not like to do a gastrostomy the day after an esophagoscopy because if the patient died I might get the blame when it really should rest with my colleague who did the esophagoscopy.

DR ARLE V BOCK I think the evidence in the literature is such that a short esophagus would be a relatively rare finding in cases with hernia of this type. Neither of the two cases on which we have had complete postmortem examinations had such an esophagus. I believe the esophagus is of normal length in most cases. I do not believe that the stricture mentioned has any relation to the hernia.

DR HAMPTON The reason I brought that up was because of the patient Dr Young has. This patient has stricture due to lye ingested at the age of two. He has a very short esophagus and a hernia similar to this one. I do not know anything about it. That is just a theory.

DR GEORGE W HOLMES I would agree with Dr Bock that the true short esophagus is a con-

and Dr Churchill to see if something could not be done to give him a useful esophagus

DR GEORGE W HOLMES We saw this child in the X-Ray Department and he created a great deal of interest because we found definite obstruction in the esophagus and air in the stomach. We did not understand how the air could reach the stomach if the esophagus was absent in its lower part. After consulting with Dr Higgins we found how this happened

The film also shows a small amount of barium in the bronchial tree, and we were able to demonstrate a stricture of the esophagus, a broncho-esophageal fistula and air in the stomach

DR TRACY B MALLORY Dr Bremer has been kind enough to come down and I hope he will tell us something about the embryological development of these conditions

DR J L BREMER The difficulty in understanding these cases lies in the lack of knowledge as to how the lungs develop. We think of them as glands, and we expect a gland to grow out from a duct, the duct to branch, and the end-pieces to develop at the ends of the branches. That is true of most glands, though certain of them lose their ducts or change in one way or another. The lungs do not grow in that way. The lung is the gland itself, the main bronchus is its duct, and the trachea, which connects the two lungs with the pharynx, is part of the original pharynx, not an outgrowth from it

If we draw a side view of the pharynx in an early embryo, beginning at the mouth and extending downward (Figure I), we find the

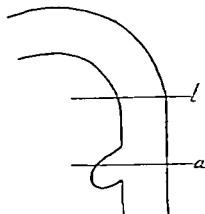


FIGURE I

lungs developing as branches or side-pocketings in the position of *a*, and that is away up in the neck. The rest of the tube continues down to the stomach. Then there is a change of relative position with a great lengthening of the pharynx between *a* and *b*, as in Figure II. The lung buds are carried relatively much nearer the stomach. The trachea is formed not by an outgrowth in the position of the lung buds, but by a subdivision of the single pharynx above this point into two tubes, trachea in front and esophagus behind, by the fusion of two longitudinal ridges, pressing the lateral walls of the pharynx. The ridges develop normally along the dotted lines of Figure II, causing the complete separation of trachea and esophagus. Partial failure of the fusion may lead to anomalies, as may also the unusual position of the ridges. Failure to close in the region of *a* would give a

connection between the trachea at its lower end and the esophagus. In that case the child could get both air and food, but there would always be the possibility of food being regurgitated into the lungs or of air getting into the stomach. If the position of the ridges is abnormal so that they cross the lower part of the future esophagus (line of dashes, Figure II) we have exactly the condition in the case under consideration,

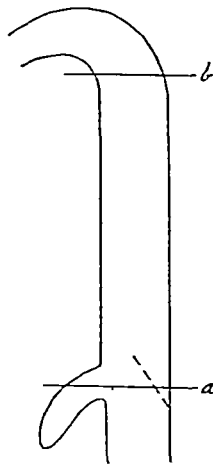


FIGURE II

the trachea opening into the bronchi and also into the lower esophagus, while the upper esophagus ends blindly

The condition arises very early. Trachea and esophagus should be fully separated in embryos of ten millimeters and Dr F T Lewis has discovered one of about that age which already showed an anomaly like that in the present case. I believe some operations for the remedy of the condition have been tried, approaching from the back, tying the trachea-esophagus connection, and attempting to reconstruct the esophagus, but I do not know how successful they have been

DR MALLORY Dr Churchill made an attempt to reconstruct things here. I hope he will tell us what he tried to do

DR EDWARD D CHURCHILL One thing in regard to the diagnosis. It is probably not advisable to give these babies barium. If there is any doubt in your mind about the diagnosis it is better to use a little lipiodol rather than barium, because the barium goes directly into the lungs and adds to the dangers of pneumonia. This child did have pneumonia at the time we operated. The diagnosis can usually be made when a baby is unable to swallow and the stomach is found distended with air. The barium comes from the blind end

What we found at operation was just what we had pictured. The upper end of the esophagus ended blindly about the level of the first or second thoracic vertebra above the arch of the aorta. The lower end of the esophagus departed from the trachea at a point just above its bi-

ing the pancreaticoduodenal artery by only one millimeter

The lungs showed a moderate degree of collapse and a very small trace of pneumonia. The other organs were all essentially negative.

DR HOLMES How far above the cardiac orifice was this?

DR MALLORY It was about 3 centimeters.

DR BOCK Did the gastric mucosa in the herniated portion of the stomach show any change?

DR MALLORY The entire stomach showed very severe gastritis from top to bottom, no essential difference above or below the hernia.

DR BOCK How much of the stomach was above the diaphragm?

DR MALLORY About three centimeters of it.

DR BOCK Not much of a pocket then?

DR MALLORY No, not a very large one. We did not measure the esophagus, but we got the impression that it was short. In the other cases of diaphragmatic hernia that I have seen the esophagus has looped around and has come into the cardia. That condition was not present here. With such an extreme degree of scarring it is reasonable that the esophagus might have been contracted as well as narrowed by the inflammatory process.

DR BOCK Was the gastritis the sort of thing we associate with ulcer of the duodenum?

DR BOCK Yes, although a little more diffuse than usual.

Have you anything to add, Dr Mosher?

DR MOSHER No, except that I came near saying this man would die of mediastinitis. I have said before that every examination of the esophagus, however simple, is a potential tragedy, and when you go down even to remove a specimen, the smaller the growth the greater is the danger in removing that specimen. If there is a fungating growth and you can take that off you can get by, but if you have a very low growth and try to get that off you run the danger of perforation. These are the cases which put the Throat Department in bad with the Medical side.

DR CHESTER M. JONES I should like to ask Dr Mosher a question if I may. In a case where one pretty strongly suspects esophageal ulcer with as much stricture as in this case, is it ever conceivable that the passage of bougies might cause damage by stretching an ulcerated area?

DR MOSHER I should be afraid of it. I should attempt with what residual skill I have left to dilate cautiously, but it is a very dangerous procedure because of the danger of splitting the scar and starting up a mediastinitis.

CASE 20062

PRESENTATION OF CASE

DR J. MARK HIEBERT * A white male infant four days old was admitted to the hospital by

*Intern on the Children's Medical Service

transfer from a suburban hospital where he was born. The delivery was normal. The birth weight was 5¾ lbs. Nothing abnormal had been noted until fluids were offered, then almost immediately they were spit up. Barium feeding was given and x-rays showed an atresia of the esophagus. Fluids and whole blood were given subcutaneously. The child was sent to the Massachusetts General Hospital for possible operation.

The child appeared normal for his age and in a fairly good condition. The temperature was 98°, the pulse 130. The respirations were 55. In the process of examination he suddenly became cyanotic. Mucus was quickly cleared from the throat and oxygen and artificial respiration were given. The throat was filled with a rather sticky mucus. The nose was obstructed with a similar discharge. The lungs were normal to percussion, but many coarse rattles and rhonchi were heard on auscultation. The heart appeared normal.

Other attacks of cyanosis occurred during the next sixteen hours, these were relieved by oxygen inhalations. X-ray examinations of the chest were repeated in this hospital. On the day following admission an operation to relieve the abnormalities was done. Following the operation there was some bleeding from the mouth. The child died twelve hours after operation.

CLINICAL DISCUSSION

DR HAROLD L. HIGGINS Our clinical diagnosis was a congenital atresia of the esophagus.

In these cases of congenital atresia of the esophagus we also find in practically every case a connection of the lower end of the esophagus with the trachea. There is a sac at the upper end of the esophagus and a connection between the lower end of the esophagus and the trachea.

In palpating the abdomen in these children one is likely to cause coughing. This child did not show such striking coughing as I have seen in some other children.

We felt that the lung signs in this case were probably due to aspiration of material that came from the stomach by the esophageal-tracheal fistula. We felt very certain that there was a connection between the trachea and the esophagus from the fact that air was seen in the stomach by x-ray. We did not think that there was such a large opening between the esophagus and the trachea as usual because the child was considerably more free from attacks of cyanosis and coughing.

The prognosis in cases of this nature has been almost universally bad. I know of no cases that have lived more than two weeks. Dr Morse in his book recommends that these children be allowed to die in peace. However, we could not quite decide to follow Dr Morse's recommendation and the child was referred to Dr Linton.

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ARE PHYSICIANS RESPONSIBLE FOR THE HIGH MATERNAL MORTALITY?

"Medical Council Approves Report Blaming Doctors for 61 per cent of Mortality" is a headline appearing in a well-known daily newspaper which is neither red nor yellow. It is maternal mortality at childbirth that is meant and the natural conclusion from the pronouncement is that if these patients had not placed themselves in the care of the physicians they would not have died. Is there any surprise that objection has been made to the publicity which has been given to the report of the subcommittee of the New

furcation and there was a rather attenuated cord leading down to a normal esophagus and then the stomach. Of course the air in the stomach had come through this route. The barium in the lungs had come from an overflow of the blind upper end into the pharynx and down the trachea. It is a difficult problem for surgery to handle. If you do a gastrostomy any food placed in the stomach will run up into the lungs.

In operations at the Children's Hospital, where they have had an extensive experience, they have attempted to bring both ends of the esophagus out through the back. Dr. Lanman has had a case of a child who lived nearly forty-five days after bringing the esophagus out and feeding through a tube. It seems to me that the difficulties of bringing up a child with the two ends of the esophagus in the back and later getting any kind of reconstruction of the two in the period of growth of the child are a little too much to contemplate. In my inexperience I decided to attempt here the all-or-none procedure of getting restoration of the esophagus in the mediastinum. We were able to go through the pleural cavity into the mediastinum, disconnect this from the trachea, close the fistula, and then using the attenuated fistulous tract to fix the upper end and pull it down a bit. An opening was made in the upper segment and a small Levine tube inserted up until it came out of the mouth. The other end of the tube was inserted into the lower end of the esophagus and entered the stomach. The mediastinal tissues were closed over the tube for the space of about one inch that lay free in the mediastinum. It looked all right when we got through. Of course a rubber tube running down the middle of the mediastinum is not very physiologic.

The child stood the operation beautifully with intratracheal anesthesia given by Dr. Bradshaw. The child left the table in excellent condition and died that night, as we expected.

DR. HARRIS P. MOSHER: Would you do it again, Dr. Churchill?

DR. CHURCHILL: I think I should. The only alternative for the infant is certain death from starvation.

CLINICAL DIAGNOSES

Atresia of esophagus, congenital
Cachexia
Bronchopneumonia?

ANATOMIC DIAGNOSES

Congenital atresia of the esophagus
Broncho-esophageal fistula.

Bronchopneumonia

Operation wound, attempted repair of atresia of the esophagus

PATHOLOGIC DISCUSSION

DR. MALLORY: The autopsy showed that everything had been carried out as Dr. Churchill described. The mediastinal tissues had been pulled around the rubber tube so as completely to encircle it, and it looked possible that at some later period if the child had survived the acute stage the rubber tube could have been removed and a tube-like passage would have been left. The story would not be over then, but at least he would have had a passageway from his mouth to his stomach.

The immediate cause of death was not entirely obvious. The lungs had been quite successfully reexpanded and there was no significant degree of collapse. There was considerable edema of the pulmonary tissues and there was a slight degree of bronchopneumonia. I think that that was the immediate cause of death, on top of the general shock of the operation to so young a child.

DR. HOLMES: Dr. Churchill has raised two questions about which I would like to speak. This is the shadow that I pointed out and made the remark that the barium had passed from the esophagus into the bronchi. It is also possible that the child regurgitated the barium and it passed into the trachea in this way. The finding of barium in the bronchi does not prove that it entered through an artificial opening.

The other point that he raised was the danger of giving barium in such a case. I would disagree with him on that point. I do not think it is any more dangerous than food, which had already been given. I remember vividly the first case that I saw of an adult with an esophageal fistula. The patient drank barium and I saw the whole bronchial tree fill. After I had advised that he be put on the danger list it occurred to me that his food had been doing the same thing for some time and that he would cough it up without trouble. In the absence of the cough reflex that might be dangerous, but as a rule one does not have to worry about barium going into the bronchial tree.

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York Academy of Medicine which has made a study of maternal mortality to determine if possible if there were evils for which medical and obstetrical practitioners might be responsible? Yet it is not the publicity but the inaccuracy that is objectionable, for just below in the text is the statement that 66 per cent of the mothers who died in childbirth could have been saved by the application of medical knowledge, and that more than 61 per cent of these avoidable deaths were directly attributable to the medical profession. Thus on its own showing only 40 per cent instead of 61 per cent of the total are attributed to the profession. It is not likely that even this conclusion will receive widespread acceptance, without a good deal of qualification, by those who know, but it and other unjustifiable conclusions are likely to be drawn by the ignorant.

There are two criteria in the light of which results may be judged. They are not so widely separated as appears at first thought. The philosopher says "Where attainable knowledge could have changed the issue, ignorance has the guilt of vice." The jurist says "the physician shall use reasonable care" which takes into consideration time, and place and circumstance.

Several questions must be asked, and they should be answered only after due knowledge is available. What is the evidence that, in general, physicians are not practicing in accord with the best knowledge and practice of today? What is the evidence that physicians are not living up to the teachings they received in medical school? Are they not doing the best they know how? What are the discrepancies between what the physician was taught in school and the best thought and practice now? Why have physicians who practice obstetrics not kept up with the times? Are practicing physicians in other fields abreast with the times, and if not why has not attention been directed to them also? How much blame should be placed on the physician for not giving the patient the best possible care, if he does the best he knows how?

The report by the New York Academy of Medicine is by no means a satisfactory answer to these questions and perhaps amounts to little more than this: there is a considerable number of women of whom the medical treatment provided cannot be characterized as the best that medical knowledge and skill can furnish, and because of this lack they die. This is true of other fields than obstetrics, but the complication of infection in childbirth is especially likely to have a fatal outcome.

It is a fact, that considering the state of medical knowledge about the processes of childbirth and what can be accomplished by the most skillful and wise obstetrician, the equipment of the ordinary physician is inadequate. Here is a serious deficiency in our medical education. The

surgical risks of childbirth are not properly appreciated by physician or layman. The growing emphasis on the value of the life of the child has tended to produce underestimation of the risk to the mother. There is a tendency, too, to insist that every patient have the best medical care, irrespective of ability to pay for it, and just at present there persists a strong tendency to report gross figures in maternal mortality without discriminating and constructive criticism, that may lead directly to real improvement in the situation.

In one sense far more is known about the prevention of tuberculosis than of puerperal infection. Why is tuberculosis not wiped out after this half century of struggle? Theoretically, whatever that may mean, the problem is simple, but deaths from tuberculosis are still numerous though the rate is diminishing. Not even theoretically is the maternal deathrate problem simple. What is needed is painstaking, thorough, intensive, scientific study of the problem from all sides, with heroic restraint, so as not to draw conclusions before adequate evidence is available.

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FOSTER, JOHN H. B.S., M.D. University of Pennsylvania School of Medicine 1917. Associate Medical Professor, Hunan-Yale Medical School, Changsha, China 1919-1927. Attending Physician, Waterbury (Conn.) Hospital. His

subject is "Amebiasis in Connecticut" Page 294 Address 103 North Main Street, Waterbury, Connecticut

CHAMBERLIN, H A M.D Tufts College Medical School 1913 F.A.C.S Professor in Urology Tufts College Medical School Urologist, Boston Floating Hospital Visiting Urologist, St Elizabeth's Hospital, Brighton. Surgeon-in-Chief, Genito-Urinary Department, Boston Dispensary Address 520 Commonwealth Avenue, Boston Associated with him is

MACMAHON H E A.B., L.M.C.C., M.D University of Western Ontario 1925 Professor of Pathology and Bacteriology at Tufts College Medical School Address 31 Pinckney Street, Boston Their subject is "Papillary Carcinoma of the Renal Pelvis" Page 299

SWEET RICHARD H M.D Harvard University Medical School 1926 F.A.C.S Assistant in Surgery Massachusetts General Hospital Visiting Surgeon, Palmer Memorial Hospital His subject is "Uterus Didelphys" Page 303 Address 205 Beacon Street, Boston

BENNETT DARWIN E B.S., M.D Harvard University Medical School 1931 Surgical House Officer Peter Bent Brigham Hospital January 1, 1932-May 1, 1933 His subject is "Recurrent Trichobezoar" Page 307 Address Methodist Episcopal Hospital, Brooklyn, New York

MARLOW, F W M.R.C.S., L.S.A., M.D Syracuse University College of Medicine 1885 F.A.C.S Emeritus Professor of Ophthalmology, Syracuse University College of Medicine Ophthalmologist to the Syracuse Memorial Hospital His subject is "The Symptoms of Hidden Ocular Muscle Imbalance" Page 309 Address 1003-4 State Town Building, Syracuse, New York.

MYERSON, ABRAHAM M.D Tufts College Medical School 1908 Professor of Neurology, Tufts College Medical School Director of Research, Boston State Hospital Visiting Neurologist, Boston City and Beth Israel Hospitals Address 270 Commonwealth Avenue, Boston Associated with him is

LOMAN, JULIUS M.D Tufts College Medical School 1925 Instructor in Neurology, Tufts College Medical School Psychiatrist, Research Staff of Boston State Hospital Junior Visiting Neurologist, Beth Israel Hospital Address 270 Commonwealth Avenue, Boston Their subject is "Progress in Neurology, 1932" Page 314

MASSACHUSETTS LEGISLATIVE NOTES

H 509 is an act regulating the administering of ether chloroform nitrous oxide gas or other substance or gas producing unconsciousness and reads

as follows The practice of medicine shall include the administering to human beings of ether, chloroform, nitrous oxide gas or other substance or gas producing unconsciousness, except when administered by a registered dentist

H 1156 is an act requiring physical examinations of persons engaged in the handling of food for public consumption, and reads as follows All cooks or other persons in any way connected with the preparation of food for consumption in a hotel inn, restaurant or other public place shall undergo semi annually physical examinations by duly registered physicians to determine whether they have any communicable disease.

H 1155 is a resolution providing for an investigation and report on the effect of gas from motor vehicles on the health of the public, and reads as follows *Resolved*, That the department of public health is hereby directed to investigate the effect of the exhaust gases from motor vehicles on the public health and to make its report to the general court with such recommendations for legislation as it may deem proper, accompanied by drafts of such measures as it may recommend on or before March fifteenth of the current year

H 919 is an act to provide for a clinic to be administered by the State Department of Public Health for treating alcohol addicts

MISCELLANY

AMERICAN MEDICAL ASSOCIATION

To Secretaries of State Medical Associations

The following instructions have been issued by the United States Compensation Commission, relative to the hospitalization of employees of the Federal Civil Works Administration

(Signed) WM. C WOODWARD

January 10, 1934 *Legislative Counsel*

UNITED STATES EMPLOYEES' COMPENSATION COMMISSION

Washington

January 8 1934

From United States Employees Compensation Commission

To State Civil Works Administrators

Re Selection of hospitals in compensation cases arising out of injuries to employees of the Civil Works Administration.

Please instruct each local administrator in your state as follows

1 Employees of the Civil Works Administration who suffer injuries while in the performance of duty are entitled to necessary hospital care for the treatment of conditions due to such injuries An injured employee shall be admitted to and retained in a hospital only as long as hospitalization is necessary for the purposes of treatment or examination. The instructions herein prescribe the procedure to be

York Academy of Medicine which has made a study of maternal mortality to determine if possible if there were evils for which medical and obstetrical practitioners might be responsible? Yet it is not the publicity but the inaccuracy that is objectionable, for just below in the text is the statement that 66 per cent of the mothers who died in childbirth could have been saved by the application of medical knowledge, and that more than 61 per cent of these avoidable deaths were directly attributable to the medical profession. Thus on its own showing only 40 per cent instead of 61 per cent of the total are attributed to the profession. It is not likely that even this conclusion will receive widespread acceptance, without a good deal of qualification, by those who know, but it and other unjustifiable conclusions are likely to be drawn by the ignorant.

There are two criteria in the light of which results may be judged. They are not so widely separated as appears at first thought. The philosopher says "Where attainable knowledge could have changed the issue, ignorance has the guilt of vice." The jurist says "the physician shall use reasonable care" which takes into consideration time, and place and circumstance.

Several questions must be asked, and they should be answered only after due knowledge is available. What is the evidence that, in general, physicians are not practicing in accord with the best knowledge and practice of today? What is the evidence that physicians are not living up to the teachings they received in medical school? Are they not doing the best they know how? What are the discrepancies between what the physician was taught in school and the best thought and practice now? Why have physicians who practice obstetrics not kept up with the times? Are practicing physicians in other fields abreast with the times, and if not why has not attention been directed to them also? How much blame should be placed on the physician for not giving the patient the best possible care, if he does the best he knows how?

The report by the New York Academy of Medicine is by no means a satisfactory answer to these questions and perhaps amounts to little more than this: there is a considerable number of women of whom the medical treatment provided cannot be characterized as the best that medical knowledge and skill can furnish, and because of this lack they die. This is true of other fields than obstetrics, but the complication of infection in childbirth is especially likely to have a fatal outcome.

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Such physiotherapy treatments as may be necessary for patients in the hospital

Autopsies and reports of same when a patient dies in the hospital

There will be no charge for medical or hospital reports unless an actual transcript of the hospital record be requested in which case charge for same will be made in accordance with the local public stenographers rates

Charges will be allowed for the day of admission but not for the day of discharge or death

In addition to the above rate it will be permissible to make the following extra charges

- (1) An operating room fee of \$5 00 for a minor operation and \$10 00 for a major operation. A general anesthesia fee of \$5 00 for a minor operation and \$10 00 for a major operation to include anesthetic service by a salaried employee of the hospital and the cost of the anesthetic
- (2) Laboratory examinations of an unusual character, such as complete blood chemistry gas tric analyses etc may be charged for at a rate of from \$3 00 to \$5 00, according to the nature of the examination (which must be specified in the voucher submitted), \$3 00 being the usual charge allowed for such examinations and reports
- (3) Fee for special nursing when necessary will be allowed in accordance with the local prevailing rate or when furnished by a salaried employee of the hospital at actual cost.
- (4) Xray examination will be paid for in accordance with the following rate the number of films and procedure for each fee being indicated by the description below

	No of films	Price
Ankle joint antero-posterior and lateral views _____	2	2 50
Arm, humerus antero-posterior and lateral views _____	2	2 50
Bladder with injection antero-posterior views _____	1	5 00
Chest, for pulmonary or cardiac diagnosis plain _____	1	3 75
Chest for pulmonary or cardiac diagnosis stereoscopic _____	2	5 00
Clavicle postero-anterior view _____	1	2 50
Elbow antero-posterior and lateral views _____	2	2 50
Fluoroscopy when required without film _____	1	1 00
Foot, antero-posterior and lateral views _____	2	2 50
Forearm radius and ulna, antero-posterior and lateral _____	2	2 50
Foreign body in eye location of (the fragment charted in three planes and its dimensions ascertained by the method of Sweet or equivalent as needed) _____		12 50

Gall bladder Graham technic, including cost of dye _____	1	10 00
Gastro-intestinal tract, complete x ray study, including fluoroscopy, as needed _____		12 50
Hand antero-posterior and lateral views _____	2	2 50
Hip joint, plain antero-posterior view _____	1	3 75
Hip joint stereoscopic, antero-posterior view _____	2	5 00
Intestine, barium clysma 14 x 17 films for position and outline, as needed _____		7 50
Jaw, upper or lower _____	1	2 50
Kidneys right and left, for comparison 11 x 14 films as needed _____		5 00
Knee joint, antero-posterior and lateral views _____	2	2 50
Leg tibia and fibula stereo-posterior and lateral views _____	2	2 50
Lipiodol injection for bronchiectasis etc. including roentgenograms and interpretation as needed _____		12 50
Pelvis 14 x 17 single film antero-posterior view _____	1	5 00
Prolography, using uroselectan or similar preparation (including cost of drug) _____	4	10 00
Ribs plain view over suspected area 10 x 12 film _____	1	3 75
Scapula _____	1	2 50
Shoulder joint, plain, antero-posterior views _____	1	2 50
Shoulder joint stereoscopic, antero-posterior views _____	2	5 00
Sinuses frontal and ethmoid antero-posterior and lateral views _____	2	5 00
Sinuses mastoid right and left sides for comparison _____	2	5 00
Sinuses maxillary antero-posterior and lateral views _____	2	5 00
Skull ventriculogram — air injection — as needed _____		7 50
Skull antero-posterior and lateral views _____	2	5 00
Skull stereoscopic _____	2	7 50
Spine cervical, antero-posterior and lateral views _____	2	5 00
Spine dorsal antero-posterior and lateral views _____	2	5 00
Spine lumbo-sacral with coccyx antero-posterior and lateral views _____	2	5 00
Stomach, barium or bismuth meal 14 x 17 film, after ingestion four 8 x 10 films for detection of duodenal cap total of four 8 x 10 films including fluoroscopy _____	4	12 50
Teeth single film _____	1	1 00
Teeth each additional film up to and including five films _____	1-5	1 00

followed in selecting hospitals for the treatment of these cases and the schedule attached shows the rates to be allowed for hospital care. In no event, however, should these instructions be construed so as to interfere with the prompt and adequate care of an injured employee.

2 Injured employees must be referred to Federal hospitals when such hospitals are both available and adequate. It is not intended to utilize these governmental facilities for civil works employees to the disadvantage of other classes of beneficiaries that may be entitled to care in Federal hospitals, but that beneficiaries for whom the respective Federal hospitals were primarily established shall have preference in the use of such hospitals. However maximum use should be made of any existing Federal medical facilities that may be available.

3 (a) When Federal hospital facilities are not available or adequate, cases requiring immediate hospital care shall be sent to the nearest suitable hospital which desires to participate in the service at the rates specified in the approved schedule of rates. Public hospitals, other than Federal, are not to be given preference.

(b) The following factors should be considered in determining suitability: the proximity of the hospital, type of service, e.g., whether the hospital is well qualified to handle the special type of case, and the general quality of service.

(c) You should secure advice as to the suitability of local hospitals from one or more of the following local sources: medical advisory councils which may already be set up under Rules and Regulations No. 7, of the Federal Emergency Relief Administration, hospital associations, hospital, health or similar councils, county medical societies, boards of public welfare or health.

4 (a) All hospital care must be authorized in writing by the proper officials on the staff of the local Civil Works Administrator. Care of emergency cases should not be delayed for a written authorization, but this must be furnished within 48 hours after admittance to a hospital.

(b) An authorized physician in charge of the treatment of an injured employee as a compensation patient when hospital care is required may send the patient to a hospital of the physician's selection provided the hospital thus selected agrees to the approved schedule of rates. However, hospitalization in such cases must be approved in writing as provided in paragraph 4 (a).

5 The Commission reserves the right to have its medical representatives examine patients at the hospital and examine the records of these patients and to cause the patient's removal when the Commission considers it necessary in the interest of the patient or to prevent overcharge, or for other sufficient reason. Hospital records of these patients shall be open to inspection by representatives of the Commission.

6 The Commission in conference with representatives of the National Hospital Associations has

agreed on a basic rate for the care of injured Civil Works Administration employees in general hospitals, exclusive of Federal hospitals. This rate includes many items for which extra charges are usually made. A schedule of rates for other services which are not included in the basic rate has also been agreed to. The National Hospital Associations have agreed to notify their members of these approved rates and urge their full cooperation with the Commission. The approved schedule of rates is attached hereto. Charges for services previously rendered will be adjusted under this schedule. (See paragraphs 34 and 35 of Civil Works Administration Rules and Regulations No. 5 for instructions concerning submission of vouchers.)

7 Each local administrator must make adequate provisions for the transportation of seriously injured employees to obtain medical treatment, by arrangements made in advance for each work project. This may be done by arrangements for the use of automobiles available at the project, by agreement concerning the use of local ambulance service or such other arrangements as may be feasible. Ambulance services provided by hospitals is covered in the approved schedule of rates.

U S EMPLOYEES COMPENSATION COMMISSION

SCHEDULE OF HOSPITAL FEES AGREED UPON BETWEEN THE JOINT COMMITTEE OF THE AMERICAN, CATHOLIC AND PROTESTANT HOSPITAL ASSOCIATIONS, THE CIVIL WORKS ADMINISTRATION AND THE U S EMPLOYEES' COMPENSATION COMMISSION

A \$3.50 per diem rate for all hospital cases of injured employees of the Civil Works Administration will be general throughout the United States, regardless of local hospital costs or charges. This rate will apply in general hospitals, exclusive of Federal.

The following items will be included in the rate:

The use of a single room when necessary	
General medical and surgical care by the house staff	
Ordinary nursing	Material for plaster casts
Special diets	Colonic irrigations
Usual medicines	Hypodermoclysis
Usual dressing and surgical supplies	
Usual laboratory tests such as	
Blood counts	Coagulation time
Smears	Haemoglobin estimation
Usual urine tests	Occult blood
Wassermann tests	Skin tuberculin tests
Precipitation tests for syphilis	Spinal fluid smears and cell counts
Widal tests	Sputum examination for tubercle bacillus
Agglutination tests	
Blood typing	
Other usual bacteriological tests	

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Many of the members of this Society have reason to remember the generous welcome he gave them when they entered the specialty, and a number owe him eternal gratitude for his very real help in their early struggles in anesthesia The Society indeed mourns the loss of a very real friend

L F S

RESOLUTIONS OF THE SENIOR STAFF OF THE BOSTON CITY HOSPITAL IN APPRECIATION OF DR. FRANK L. RICHARDSON, LATE VISITING ANESTHETIST

Dr. Frank Linden Richardson of Newtonville, Massachusetts, died suddenly on November 16, 1933. He was born in Concord, Massachusetts, in 1877. He graduated from the Massachusetts Institute of Technology and then entered Harvard Medical School, graduating in 1903. He is survived by his widow, Mrs. Constance Mathey Richardson, and two sons, Paul H. Richardson and David A. Richardson, both of whom are students at the Massachusetts Institute of Technology.

He served an internship in the surgical department of the Boston City Hospital from 1904 to 1906 and became head of the Anesthesia Service in 1910. He was a consultant in anesthesia at the Children's Hospital and Beth Israel Hospital and lecturer on anesthesia at Tufts Medical School.

Among his earlier publications was one written in conjunction with the late Dr. Edward H. Nichols on Arthritis; this paper was an outstanding contribution and is still regarded as the model description of this disease. His later publications included *Some Modern Ideas About Anesthesia*, *Heart Lesions in Anesthesia*, *Anesthesia for Minor Surgery*, *Anesthesia for Prostatectomy*, *Some Suggestions for the Dietetic, Pre-Operative and After-Care of Surgical Cases*. His societies included The Massachusetts Medical Association, Medical Association, Boston Society of Anesthetists, International Anesthesia Research Society, Associated Anesthetists of the United States and Canada, Eastern Society of Anesthetists (first President).

Being of an inventive nature, he was constantly constructing and improving anesthesia apparatus. He contributed appreciably to the safety and accuracy of these machines. He also completed a motion picture on the use of anesthetics.

By his death our staff has lost one of its most valued members. His advice on anesthesia problems was frequently sought and always cheerfully given. We shall miss his unusual talents, which were freely given to the hospital for many years. While extending our sympathy to his family, we wish to express our appreciation for the many years of faithful and unselfish service which he rendered.

P. F. BUTLER, *Secretary, Senior Staff*

January 25, 1934

IN MEMORIAM

DR. GEORGE L. RICHARDS

Dr. Richards was born in Farmington, Connecticut, June 1, 1863, and died in West Dennis, Massachusetts, November 9, 1933.

For several years he was on the Consulting Staff of the Cape Cod Hospital. His specialty was the ear, nose and throat, and in that branch of medicine and surgery he was a national figure. In 1930 he was elected to the Attending Staff.

By his passing it is but fitting that in tribute to his memory, we should speak of the excellencies of his good deeds.

He was a man of great civic pride and always took a prominent part in the affairs of the community. One could not fail to be impressed with his high Christian character and integrity. He also had that rare and mysterious quality which enabled him to see the best in everyone and it attracted to himself a legion of friends.

It was Dr. Richards' desire and ambition to make our Hospital not only a place of service to the community but a real haven for the comfort of those in distress of body and in peril of pain and death. He understood its problems as only a few men have and gave of himself unsparingly to its service. Those of us who knew him served with him, and understood him seemed to catch something of the contagion of his pluck and patience. We came to appreciate the warm current of underlying kindness which ran through his whole life.

We shall feel his loss keenly at the Staff meetings and in the consultation room where his presence was always an inspiration and a welcome and dependable asset.

As a surgeon he was skilful, as a citizen he was a keen and understanding observer of world affairs, as a friend he was steadfast and true.

Be it resolved that the heartfelt sympathy of the members of the Cape Cod Hospital Staff be extended to his family in their bereavement.

Be it further resolved that the memorial be spread upon the records of the Cape Cod Hospital Staff and a copy thereof be sent to the family of the deceased.

DR. E. S. OSBORNE

DR. J. P. NICKERSON

DR. C. E. HARRIS

Committee

- | | | |
|--|--------|------|
| Teeth, series, (five films up to and including full mouth) _____ | over 5 | 5 00 |
| Thigh, femur, antero posterior and lateral views _____ | 2 | 3 75 |
| Ureters, right and left, for comparison _____ | 1 or 2 | 7 50 |
| Wrist, antero-posterior and lateral views _____ | 2 | 2 50 |
- (5) Unusual expensive medication and appliances will be supplied at cost. This includes such items as oxygen administration (marked preference being given to the use of commercial oxygen) biologicals, prosthetic and orthopedic appliances, when furnished by the hospital. Blood transfusions not to exceed \$5 00 per 100 cc to donor, and a hospital charge of \$5 00 for the transfusion as a minor operation will be allowed.
- (6) Ambulance charges when furnished by the hospital may not exceed a minimum rate of \$3 00 when the call is within a three mile radius of the hospital. An additional rate of 50c per mile beyond the three mile radius, one way, will be allowed.
- (7) Professional and other fees of persons not employed by the hospital are not included in this agreement.
- (8) Fees for hospitalization, and prophylactic treatment of contagious diseases not ordinarily treated in general hospitals are not included in this agreement and should be subject to local regulation.

CORRESPONDENCE

THE RESTORATION OF THE REGISTRATION OF DR. DWIGHT F WILLIS

Editor, New England Journal of Medicine,

This is to inform you that at a meeting of the Board of Registration in Medicine held January 25, 1934, it was voted to restore to Dr Dwight F Willis his license, suspended September 28, 1933

Yours very truly,

STEPHEN RUSHMORE, M D, *Secretary*

RECENT DEATHS

HOWE—JOSEPH DIMOCK HOWE, M D, of Pittsfield, Massachusetts, died in that city January 30 1934 after a two weeks' illness. Dr Howe was born in 1869 in New Baltimore, New York, and graduated in medicine from the Tufts College Medical School in 1898.

He joined the Massachusetts Medical Society in 1899, and was a Fellow of the American Medical Association. He had served as assistant medical examiner of his district for fifteen years.

During the Spanish American War he was a Y M C A. worker at Chicamauga, and held membership

in Richard H Dowling Camp, Veterans of the Spanish American War. He served as a member of the Pittsfield School Board in 1915 1916. Previous to settling in Pittsfield, he practiced in Becket and Cheshire. He was a Mason and was affiliated with the Congregational Church.

Surviving relatives include a sister, Winifred Hayden Howe, of Pittsfield, a brother, Ralph Barnard Howe, of Schenectady, New York, and several nieces.

RIOPELLE — ALEXANDER JOSEPH RIOPELLE, M D, who had practiced in Lawrence, Mass., for forty five years, died at the home of his daughter, Mrs Adelard G Valcourt, 75 Tremont Street, Lawrence, January 26, 1934. He is survived by five daughters, three sons and a sister.

BOOM — AUGUSTUS KEEFER BOOM, M D, of 51 Park Street, Adams, Massachusetts, died January 24, 1934. Dr Boom was born at Albany, New York, May 13, 1866, son of James and Lucy Boom. He was graduated from the Cleveland College of Physicians and Surgeons in 1888 and settled in Adams that same year. He joined the Massachusetts Medical Society in 1897. He served as president of the Berkshire District Medical Society in 1916. He served as selectman of Adams for three terms and for a part of these periods was chairman of the board. He was later a member of the Board of Health and town physician. He was a member of the staff of the North Adams and the Plunkett Memorial hospitals. He was an examiner for the Metropolitan Life Insurance Company for many years. He is survived by his widow, Mrs Myria S (de Rouville) Boom, two daughters, Miss Hazel and Miss Florence Boom, also his mother, living in Albany, New York, a sister, Mrs Joseph Jewell, and a brother, James Boom.

OBITUARIES

FRANK LINDEN RICHARDSON, M D

In the death of Frank Linden Richardson, the Boston Society of Anesthetists has lost one of its original and most valued members, a former President, and the Dean of Anesthesia in Boston.

Born in 1877 he died suddenly of coronary occlusion on November 16, 1933. He was a special student at the Massachusetts Institute of Technology, he received his M D degree from the Harvard Medical School, and he interned at the Boston City Hospital. His work in anesthesia won him wide recognition from the surgeons of Greater Boston, perhaps especially from those doing nose and throat work. This recognition of his work is evidenced by the positions which he held, such as chief of the Anesthesia Service at the Boston City Hospital, Consultant in Anesthesia at the Children's Hospital, and Lecturer in Anesthesia at the Tufts College Medical School.

He was also the first president of the Eastern Society of Anesthetists

In his professional work he held a nice balance between progressiveness and conservatism. His judgments were sound and highly valued. Perhaps the most outstanding characteristic of his work was its nicety of detail. There was never any suggestion of crudeness or roughness. He loved fine mechanics, and had both at his office and at his home a jeweler's lathe and other fine tools with which he loved to work. His ether vaporizer, almost universally adopted by the anesthetists of Boston was a product of this work.

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For several years he was on the Consulting Staff of the Cape Cod Hospital. His specialty was the ear, nose and throat, and in that branch of medicine and surgery he was a national figure. In 1930 he was elected to the Attending Staff.

By his passing it is but fitting that in tribute to his memory we should speak of the excellencies of his good deeds.

He was a man of great civic pride and always took a prominent part in the affairs of the community. One could not fail to be impressed with his high Christian character and integrity. He also had that rare and mysterious quality which enabled him to see the best in everyone and it attracted to himself a legion of friends.

It was Dr. Richards' desire and ambition to make our Hospital not only a place of service to the community but a real haven for the comfort of those in distress of body and in peril of pain and death. He understood its problems as only a few men have and gave of himself unsparingly to its service. Those of us who knew him, served with him, and understood him seemed to catch something of the contagion of his pluck and patience. We came to appreciate the warm current of underlying kindness which ran through his whole life.

We shall feel his loss keenly at the Staff meetings and in the consultation room where his presence was always an inspiration and a welcome and dependable asset.

As a surgeon he was skilful, as a citizen he was a keen and understanding observer of world affairs, as a friend he was steadfast and true.

Be it resolved that the heartfelt sympathy of the members of the Cape Cod Hospital Staff be extended to his family in their bereavement.

Be it further resolved that the memorial be spread upon the records of the Cape Cod Hospital Staff, and a copy thereof be sent to the family of the deceased.

DR. E. S. OSBORNE

DR. J. P. NICKERSON

DR. C. E. HARRIS

Committee

NOTICES

RADIO HEALTH MESSAGES

FEBRUARY MARCH, 1934

Sponsorship Public Education Committee of the
Massachusetts Medical Society and Massachusetts
Department of Public Health

Courtesy WBZ Fridays, 4 30 P.M.

February

- 9 Milk
- 16 Stomach Trouble
- 23 Lumps in the Neck

March

- 2 Age and Cancer
- 9 Some Problems of Epilepsy
- 16 Fractures
- 23 How to Keep the Well Child Well
- 30 Résumé of the Year's Work

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Courtesy WEEI Fridays, 5 00 P.M.

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THE BOSTON TUBERCULOSIS ASSOCIATION

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January 30, 1934 The expenditures for the year
were \$41,532.02 The unexpended balance was \$5.11.
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small balance will be applied

The following officers were elected President,
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Wheeler, Mrs Reginald Heber White, Dr Charles F
Willinsky, and Dr Nathaniel K Wood

AMERICAN ASSOCIATION FOR THE ADVANCE-
MENT OF SCIENCE

SECTION N (MEDICAL)

WEDNESDAY MORNING SESSION, DECEMBER 27,
10 30 A.M.

John Ware Hall, Boston Medical Library

Dr George Bigelow of the Massachusetts General
Hospital presided in place of the Chairman, Dr
C R Stockard, who was ill

The opening paper was presented by Dr Reuben
L Kahn, developer of the well known Kahn reac-
tion, on "Tissue Reactions in Immunity" Dr Kahn
pointed out that present conceptions of immunity,
other than those of a toxin-antitoxin nature, assume
the primary importance of the body fluids, notably
the blood, but do not account for those reactions ob-
served in the skin and other tissues The hyper-
sensitive reactions of these in the sensitized animal,
he believes, can be explained on a common basis
with the reactions occurring in the blood, and the
body tissues, of the immunized animal which have
undergone one basic change, that of acquiring the
ability to collect and react with antigen thereby
protecting the organism In blood, phagocytosis
occurs in fixed tissues, and localization of the toxic
material takes place, preventing access to the blood
and other fluids and hence to the body generally
Dr Kahn bases this on work with albino rabbits in
which he believes he has shown that the fixed tis-
sues are not neutral bystanders while the body
fluids react to toxins given intra and subcutaneous-
ly, and intraperitoneally Using horse serum intra-
cutaneously as antigen, he obtained reactions from
the tissues after precipitin and other blood re-
sponses had disappeared Using horse serum anti-
toxin, by which means quantitative measures could
be employed he found that the number of units re-
quired to protect sensitized animals from additional
injections of toxin was over 50 times the amount
needed for non-sensitized controls receiving the
same doses intracutaneously This he explained as
being due to the reaction of the fixed tissues to

horse serum, which localized the antitoxin in the sensitized animals with resultant non absorption and failure to reach the toxin injected into the blood. Subcutaneous, intraperitoneal, intramuscular and intracerebral injections of the serum antitoxin mixture gave similar reactions, although less marked in the last two.

If the assumption of the primary importance of the fluid tissues were true these reactions should have been alike. Dr Kahn concluded that changes of all the tissues in immunity are unified processes in which the fixed tissues function by detecting, anchoring, and so preventing the spread of toxins with subsequent protection to the organism.

Dr Irving J Walker of the Boston City Hospital presented the second paper, his subject being "Why the Increasing Mortality in Appendicitis?" He believes that while more deaths are recorded as due to appendicitis according to vital statistics, a misunderstanding or misinterpretation has arisen because the incidence of operations has not been taken into account. A study of the relation of deaths to the incidence of operations, past and present, should give a truer picture. Certain other factors, as changed and improved methods of diagnosis, ascribing pre and postoperative deaths due to complications as due to appendicitis would lead to higher rates. He concludes, in part, that from a study of vital statistics the rate is rising from the incidence of operations the rate is falling that there has been a misunderstanding due to the different methods employed in gathering figures and in not considering the change in incidence of operations. He warns against operations by the occasional operator and against operations for so-called chronic appendicitis.

The third paper was read by Dr Herbert L Lombard of the Massachusetts Department of Public Health who spoke on "Results of an Appendicitis Campaign." He said that working somewhat along the lines of a campaign in this state against cancer an attempt was made to educate the public to the danger of delay in seeking medical advice (arbitrarily defined as any period over 24 hours after the onset of symptoms) and use of laxatives for abdominal distress. The results of the campaign were not so marked as were those obtained in the work against cancer where a greater amount of attention was given to the use of newspaper advertisements. He believes that this agency was neglected or else the population at large is more apathetic to appendicitis.

WEDNESDAY AFTERNOON SESSION DECEMBER 27

Symposium on Pneumonia

Dr Lloyd D Felton of the Harvard Medical School began the symposium with the subject "Pneumococcus Antibodies, What Are They?" He has found that the protective substance is little if at all organotropic, but highly bacteriotropic, is water-insoluble and difficult to study because of no suffi-

ciently delicate protein test and the small amounts used. He found also that the antigen-antiserum union could be made reversible to about 85 per cent. He concludes that at present we cannot say the active antibody is anything but a protein-like compound, perhaps of a new type as its isoelectric point of 6.8-7.4 would indicate. Possibly this may be separated into active non-protein fractions, although this has as yet to be done.

W F Wells of the Harvard School of Public Health presented the next paper, discussing "Viability of Bacteria in Air." He assumes that organisms enter the air as the nuclei of droplets and depending on the size of these latter, the temperature, humidity, and viability of the bacteria, the ultimate deposition follows. In general the larger droplets go but a short distance before reaching the floor as the size decreases, the interval before leaving the atmosphere increases and may be greater than the viability of the organisms. Using an experimental chamber spores were obtained from the air after it had been quiet for a week. Pfeiffer's bacillus disappeared in 80 minutes, pneumococci, streptococci and diphtheria organisms were cultured after one day, and staphylococci after three days. Sprays of the colon-dysentery group gave negative cultures after a few hours. An air centrifuge for obtaining cultures from known amounts of air and at the same time planting them on the desired media was shown.

Dr Smillie, also of the Harvard School of Public Health spoke on "The Epidemiology of Lobar Pneumonia—Recent Studies." Working on Types I and II, a series of contacts were studied. These were divided into family and hospital contacts for each source of contact. It was found that cultures of those exposed to Type I showed that 1.6 per cent of the hospital contacts became carriers of a homologous strain while the rate was 24.2 per cent for the families. In Type II the rates were 3 per cent and 16.2 per cent, respectively. It was also noted that family contacts had as high a rate after an exposure of one day as after several. Colds made little difference, although 96 per cent of those acquiring homologous strains by contact had them. In summary, Dr Smillie states 264 contacts with Type I or II pneumonia were studied. 20 per cent of the family contacts and 2.3 per cent of those in hospitals acquired an homologous strain of one or the other of these organisms. Hence it is probably safe to allow patients with pneumonia on general wards the number of those becoming carriers by contact who develop a corresponding pneumonia being very small.

Dr Frederick T Lord of the Massachusetts General Hospital presented the last paper taking "Serum Treatment in Pneumonia" as his subject. Serum treatment is at present limited to cases of Types I and II which account for approximately 57 per cent of all pneumonias. The ages between 28 and 50 years are the ones typically affected and postoperative cases, children and vascular failures

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toxin, by which means quantitative measures could
be employed, he found that the number of units re-
quired to protect sensitized animals from additional
injections of toxin was over 50 times the amount
needed for non-sensitized controls receiving the
same doses intracutaneously This he explained as
being due to the reaction of the fixed tissues to

400 per cent and it is hoped that a standard will be developed to do away with this variation. Other chemical compounds have not as yet been found which have any individualism in respect to their occurrence in certain strains only

Finally, no specific treatment has been devised for infection of the human host by the tubercle bacillus

Dr Henry D Chadwick of the Massachusetts Department of Public Health was the second speaker, presenting "The Incidence of Tuberculosis" with special reference to Massachusetts. In this state the period of greatest freedom is in those under the age of ten years. After this there is a more or less steady rise to the age of 70 or 75 in males, females show a somewhat sharper rise with a smaller total to the 20-29 year group, a slow decline to 55 years, and a final increase nearly reaching the level of the other sex. More females are affected in early middle life but more males eventually die. It should be noted that the popular idea that once past 45, the dangers from tuberculosis are over is erroneous, as it actually is the reverse.

Dr Edward D Churchill of the Massachusetts General Hospital presented the last paper 'Surgery in Tuberculosis'. He believes there are no definite rules for the indications for surgery, the physician and surgeon together being needed to decide. However operation is not a last resort as it once was, present results being comparable to those obtained in peptic ulcer operations for example. He states that surgery acts by immobilizing the affected lung, allowing healing fibrosis, obliterates cavities, reduces the amount of retained sputum, prevents or arrests hemorrhages and retards the progress of the disease. The type of operation has changed somewhat — Sauerbruch's thoracoplasty has been abandoned as not giving sufficient collapse, a wider resection of ribs with removal (complete) of the first two in apex infections being advocated. The use of more than one-stage operations has likewise been of aid. A partial collapse of one apex with a functioning lower lobe can be done with success. Phrenic nerve paralysis is attended with no permanent loss of function as is phrenicotomy, and should be remembered in questionable cases. Cavitation should not be treated by these measures.

The importance of proof of the clinical diagnosis is great, as other lung conditions are now being operated on and it may make a great difference to the patient, as more and more favorable results are following operations for cancer and bronchiectasis with surgical treatment. A loose diagnosis of tuberculosis may be a dangerous thing. Dr Churchill believes large hospitals or any institution handling tuberculosis should have a prediagnosis ward where all patients are kept until positively diagnosed by culture smear, or other means until this has been done treatment cannot properly be decided on.

On Friday December 29, 1933 the morning session was devoted to a joint meeting of the American Pharmaceutical Association with the American Col-

lege of Dentists. Dr Theodore Bradley presided. In the afternoon and evening of the same day, there was a joint meeting of the American College of Dentists with Section N. Several short papers on problems of dental and medical interest were presented.

On Saturday morning December 30, 1933, the American Society of Parasitologists met with Section N. Short papers were presented by Drs Hans Zinsser, Henry Pinkerton, S B Wolbach, and Marshall Hertig of the Harvard Medical School, and by Dr R. R. Parker of the United States Public Health Service.

THE WORCESTER NORTH DISTRICT MEDICAL SOCIETY

The presence of President William H Robey of the Massachusetts Medical Society accounted for the most largely attended meeting of recent years of the Worcester North District Medical Society at the Leominster Hospital, Wednesday January 24. Dr Robey spoke on matters pertaining to the work of the Federal Emergency Relief and the C.W.A. He was able to clear up many uncertainties in the minds of the members in relation to these two programs. His talk was very enlightening.

Dr Thomas J O'Brien was also present and related matters of interest in regard to legislative bills that are now pending. Both speakers brought to the members an enthusiasm that was greatly appreciated.

About 60 doctors enjoyed a splendid turkey dinner served by the wives of the Leominster members of the Society.

FRANCIS M. McMURRAY, M.D., *Secretary*

THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

The Massachusetts Association of Boards of Health, one of the oldest public health organizations in this country at its annual meeting at The University Club, Boston, Thursday, January 25, declared for the formation of regional chapters of specialized public health workers.

Only those who are members of the association are eligible to membership in the regional chapters which will elect their own officers and have representation on the Executive Committee of the association. The regional chapters will hold meetings independent of the association but the annual meeting of each chapter will be held on the same day and at the same place as that of the State Association.

The Executive Committee in the past has been composed of five elective members and the past presidents ex-officio and the President has appointed the committee on nomination of officers. A change was made in this latter procedure so that hereafter a nominating committee of three will be elected at the October meeting, each member eventually to serve for five years and each not to be eligible to reelection.

Dr Francis P. Denny of Brookline. Dr Geo. Francis

are usually exempt from infection with these types

Dr Lord mentioned the use of the Sabin modification of the Neufeld method of typing—sputum containing the organisms is obtained and when these are brought into contact with rabbit antiserum of an homologous strain, marked swelling of the capsule occurs. The advantages of this method are that the typing can be done at the bedside and requires but a few minutes, with consequent saving of time in deciding on the use of antiserum.

With treatment in Type I cases in the first three or four days, 102 per cent of patients have died in a group studied in Massachusetts, and 24 per cent when untreated. In Type II, less complete figures are available but show approximately a 40 per cent mortality without serum and 29 per cent with it. Other types have not shown a response to antisera as yet.

There are certain difficulties in giving treatment—the patients are seen too late in general hospitals, laboratories are few, the antiserum expensive, general practitioners see relatively few cases. For the last three years a fund has been available in this state to study the treatment of lobar pneumonia, technicians and Felton's antisera being furnished. An extension of a year has made it possible to continue this for what will be a total of four years.

Dr Lord concluded with a description of the dosages employed, restrictions and precautions to be observed in treating pneumonia patients with antisera.

The meeting was continued on Thursday with a Symposium on Sociology and Medicine in the morning session. The first speaker was Dr Henry E Sigerist of Johns Hopkins University, whose subject was "The Interrelationship of Medicine and General Culture." He stated that among the Semites sickness carried the odium of sin, among the Greeks, of inferiority, that later, notably during the Renaissance, the sense of odium was lost and suffering was believed good for the soul, the sick receiving a preferential place in society, as they now do. He believes that present changed conditions require a program for guidance and doubts if the Fascist system in Italy and Nazist in Germany will be productive.

Mr Henry S Dennison of Framingham, Mass followed with "Medicine in Relation to Social Trends." He notes a turn toward organization and consolidation in medicine as in industry and government. He believes an increase of routine and preventive care among the poorer classes is needed and would open a new "market" for medicine without eliminating the individual doctor in the same way that the chain store has not ended the local store. He thinks there is a great need for the doctor's knowledge of human nature in politics and economics and hopes that there will be a fulfillment of this.

The third paper was by Douglass V Brown of the

Harvard Medical School who spoke on "Some Economic Aspects of Medicine." He did not attempt the solution problem of the individual doctor, he believes much progress might well be made in medicine in future legislation, the technical aspect not being the only source of advancement.

"Teaching the Social Implications of Sickness to Medical Students" was given by Ida M Cannon of the Massachusetts General Hospital, Boston. She stressed the importance of "social" case teaching—the need of drawing attention to the social, temperamental, and environmental aspects as well as the medical side of the patient for a complete understanding.

Dr George R. Minot Boston City Hospital, concluded the symposium with "Social Medical Practice." He feels that the diagnosis of the person is too often neglected for the diagnosis of the disease. At present, the doctor's acquaintance with the patient other than as a case of a certain disease requires a conscious effort and is not automatic as it was 100 years ago. This is especially true in hospitals, where social service is a needed and important organization. The private doctor, while calling in specialists, must remember to look out for this side of his patient. Long sickness as in peptic ulcer and arthritis especially need such attention, an adjustment of the views of life may even be necessary. The results well repay the effort made.

Thursday afternoon was devoted to a symposium on Tuberculosis. Dr William C White of the National Tuberculosis Association, Washington, D C, talking on "The Biology of the Tubercle Bacillus," opened the meeting. He discussed the life cycle apart from multiplication by binary division and collection of monocytic cells about a primary focus of infection, which the acid fast organisms of leprosy and John's disease of cattle also call forth. He described the method of large scale culturing on artificial media as that devised by Long, by which a study of the chemistry of the organism and its products as well as the effect of changes of the constituents could be effected. Direct observation, aided by photography, and a study of the metabolism of the bacillus are also being used. We are still ignorant, however, of what goes on when the organism is outside the body.

It has been found that all types are of a virulent or rough, a less virulent or smooth type and, in the case of the avian type the change by cultural methods from rough to smooth has actually been carried out.

All the acid fast group have common compounds, but the human type has been found to have a peculiar fatty acid which in pure form produces all the reactions of the tubercle bacillus in the body from the attraction of monocytic cells to caseation without the presence of live organisms. The skin reactions are produced by a protein compound peculiar to human and bovine strains. At present the old tuberculin used in skin testing varies as much as

The Teaching of Industrial Hygiene Leverett D
Bristol MD, Health Director, American Tele-
phone and Telegraph Company, New York.

Discussion Edward C Holmblad, MD, Chicago

The Function of the Physician in Public Health Edu-
cation. W W Bauer, MD, Director, Bureau of
Health and Public Instruction, American Med-
ical Association, Chicago

Discussion H S Cumming MD Washington DC
Red Lacquer Room

TUESDAY AFTERNOON, 2 00

The Federation of State Medical Boards of
The United States

G M Williamson M.D., Presiding

Traffic in Narcotics by Licensed Physicians H J
Anslinger, United States Commissioner of Nar-
cotics, Washington DC

Discussion W L Treadwar, M.D., Washington, DC

The Use of the Injunction Procedure in Enforcing
Medical Practice Acts F Manley Brist, LL.B
Attorney Minnesota Board of Medical Examiners
St. Paul

Discussion H M Platter MD, Columbus Ohio
Room 14

Federation Dinner Monday 6 30 Palmer House
The Federation of State Medical Boards of the United
States Address Relation of Education to Licensure
Walter A. Jessup, Ph D President, State University
of Iowa Iowa City Presidential Address by G M
Williamson M.D Informal round table discussion

Evening Meeting Monday 8 15 Red Lacquer Room
Palmer House American Conference on Hospital Serv-
ice. Address The Old and the New in Medicine
Dean Lewis MD President, American Medical As-
sociation Baltimore

Luncheon Tuesday 12 30, Grand Ball Room Palm-
er House Central Council for Nursing Education.
Address What Is the Future of Nursing Hugh
Cabot MD, Professor of Surgery University of Min-
nesota Graduate School of Medicine Minneapolis

REDUCED RAILWAY FARES

Reduced railway fares will be in effect for those
who attend the Congress In some cases excursion
rates are offered. In most instances however the re-
duced rate will be upon the certificate plan and it
is necessary to obtain a *certificate* at the time of
purchasing After the certificate has been counter-
signed by a representative of the railroads at the
Congress it will entitle the holder to a reduction
on the return trip

PHI DELTA EPSILON FRATERNITY BOSTON UNIVERSITY SCHOOL OF MEDICINE

There will be an open meeting of the Phi Delta
Epsilon Fraternity of the Boston University School

of Medicine at the Evans Memorial Hospital Au-
ditorium, 80 East Concord Street, Boston, on Friday,
February 16 1934, at 8 P M

The topic for discussion will be The Treatment
of Angina Pectoris and Congestive Heart Disease
by the Total Ablation of the Normal Thyroid Gland
The speakers

Medical aspect Dr Herrman L Blumgart

Surgical aspect Dr David Berlin

The discussion will be led by Dr William D Reid.
Physicians and medical students are invited

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medi-
cal Club will be held at the office of the Boston Tu-
berculosis Association 554 Columbus Avenue Bos-
ton on Tuesday February 20 1934 at 12 noon The
speaker will be William C Quinby MD Clinical
Professor of Genito-Urinary Surgery Harvard Medi-
cal School Urologist Peter Bent Brigham Hospital.
His subject will be 'Tumors of the Genito-Urinary
Organs this to be illustrated with Lantern Slides
All physicians are cordially invited to attend. The
usual luncheon will be served at 1 o'clock

MASSACHUSETTS ITALIAN MEDICAL SOCIETY

The regular monthly meeting of the Massachusetts
Italian Medical Society will be held in the Hotel
Westminster, Boston February 12 at 8 P.M. Tele-
phone Kenmore 5100

Business

Communications

'Obstetrical Conservatism with a Resumé of 1000
Cases' Dr B Macchia

General Discussion

The medical profession and medical students are
cordially invited

CARL F MARALDI, M.D., *Secretary*

276 Commonwealth Avenue, Boston

MASSACHUSETTS MEMORIAL HOSPITALS

The monthly meeting of the Surgical Section will
be held in the Trustees Room of the Hospital on
Friday, February 9 1934 at 12 noon

Dr W D Rowland will address the members on
Common Problems of the General Surgeon and
Ophthalmologist."

RALPH C WIGGIN, *Secretary*

NEW ENGLAND WOMEN'S MEDICAL SOCIETY

The fifty sixth annual meeting of the New Eng-
land Women's Medical Society will be held at The
Hotel Vendome on Thursday February 15 1934
Business meeting at 6 30 Dinner at 7 o'clock
Speakers will be Mrs Eva Whiting White and Miss
Svbil Holmes

ELIZABETH L. BROYLES *Secretary*

Curtis of Newton, Dr George H Bigelow, former State Health Commissioner, and Prof Curtis M Hilliard of Simmons College, each of whom served on the committee recommending the changes in the constitution, were delegated to proceed with the reorganization of the association as planned

State Health Commissioner Henry D Chadwick explained bills affecting public health now before the Legislature

The officers elected for the current year (the association to function as in the past until the regional chapters are formed) are the following

President Joseph B Glennon, New Bedford

First Vice President, Dr Paul N Withington, Milton

Second Vice-President, Dr Ernest M Morris, Fall River

Secretary Treasurer, George T Lennon, Haverhill

Elective members of the Executive Committee
Dr M Victor Safford, Boston Dr William O Hewitt, Attleboro Dr Peter O Shea Worcester Dr J H Lawrence, Brockton Dr Curtis M Hilliard, Wellesley

THIRTIETH ANNUAL CONGRESS ON MEDICAL EDUCATION LICENSURE AND HOSPITALS

FEBRUARY 12 AND 13, 1934

Palmer House, Chicago

PROGRAM

MONDAY MORNING, 10 00

Review of the Accomplishments of the Council on Medical Education and Hospitals Ray Lyman Wilbur, M D, Chairman, Stanford University, California

Philosophy of Professional Licensure Justin Miller, J D, Dean, Duke University School of Law, Durham, N C

Discussion Alphonse M Schwitalla, S J, Ph D, St. Louis

Medical Education and Its Relationship to Society as a Whole Robert G Sproul LL D, President, University of California, Berkeley

Discussion E P Lyon, M D, Minneapolis

The Restoration of the General Practitioner Dean Lewis, M D, President, American Medical Association, Baltimore

Discussion James B Herrick, M D, Chicago J H Musser, M D, New Orleans

Red Lacquer Room

MONDAY AFTERNOON 2 00

Joint Session of the Council on Medical Education and Hospitals and the American Conference on Hospital Service

Merritte W Ireland, M D Presiding

Responsibility of the Hospital Trustee and the Relationship Between the Trustees and the Staff

Howard S Cullman, President, Beekman Street Hospital, New York

Discussion Nathaniel W Faxon, M D, Rochester, New York.

Symposium Size and Scope of a University Clinic.
Henry, Houghton M D, Director, University of Chicago Clinics

Nathan B Van Etten, M D, Vice Speaker, House of Delegates, American Medical Association, New York

John H J Upham, M.D, Dean, Ohio State University College of Medicine, Columbus

Discussion William D Haggard, M D, Nashville
John Wyckoff, M D, New York, Austin A. Hayden, M D, Chicago

Red Lacquer Room

TUESDAY MORNING, 9 00

Joint Session of the Council on Medical Education and Hospitals and the Federation of State Medical Boards of the United States
G M Williamson, M D Presiding

The Privilege of Reëxamination in Professional Licensure Bernard C Gavit, J D, Dean, Indiana University School of Law, Bloomington

Discussion G M Williamson, M D, Grand Forks N D

Résumé of the History and Present Application of Medical Licensure in the States J N Baker, M D, Secretary, Alabama Board of Medical Examiners, Montgomery

Discussion A T McCormack, M D, Louisville

Reciprocity Agreements J R Neal M D, Secretary, Professional Committee for Medicine, Illinois Department of Registration and Education, Springfield

Discussion Harold Rypins, M D, Albany, N Y

Medical Licensure in South America—Preliminary Survey William D Cutter, M D, Secretary, Council on Medical Education and Hospitals, Chicago

Discussion Frederic W Schlutz, M D, Chicago

Red Lacquer Room

TUESDAY AFTERNOON, 2 00

Reginald Fitz M D Presiding

The Importance of Introducing Psychiatry Into the General Internship Franklin G Ebaugh M D, Director, Division of Psychiatric Education, The National Committee for Mental Hygiene Denver

Discussion C C Burlingame, M D Hartford, Conn.

The Incorporation of the Principles of Preventive Medicine in Clinical Teaching Wilson G Smillie M D Professor of Public Health Administration, Harvard University, Boston

Discussion C Sidney Burwell M D Nashville

February 13—Massachusetts Physiotherapy Association. See page 342

February 13—Harvard Medical Society See page 342.

February 14—New England Dermatological Society will meet at 3 P.M. at the Massachusetts General Hospital.

February 14—Greater Boston Medical Society will meet at the Beth Israel Hospital, Boston from 8 A.M. to 4 30 P.M.

February 15—Massachusetts General Hospital, Clinical Meeting of Staff See page 342

February 15—New England Women's Medical Society See page 341

February 16—Phi Delta Epsilon Fraternity See page 341.

February 16—New England Section of the Illuminating Engineering Society See page 342

February 16—The New England Roentgen Ray Society See page 342

February 16 and 17—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club Boston. For details write Dr A. G. Engelbach Massachusetts General Hospital, Boston

February 20—South End Medical Club See page 341

February 20—Malden Medical Society See page 342

February 26—New England Heart Association. See page 342.

March 5, 6 and 7—The Southeastern Surgical Congress will be held at Nashville Tenn. For information write Dr B. T. Beasley 1019 Doctors Building Atlanta.

March 9—William Harvey Society at Beth Israel Hospital. Speaker Dr Irving J. Walker Clinical Professor of Surgery Harvard Medical School. Subject Judgment and Conscience in Surgery

March 12—House Officers Association Boston City Hospital 8 00 P.M. Speakers Drs A. Warren Stearns Abraham Myerson. Subject Forensic Psychiatry

April 16—Boston University School of Medicine to conduct a Clinical Meeting at Boston City Hospital. See page 342

April 16-20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House. For information write Mr E. R. Loveland Executive Secretary 133-135 South 36th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C. Guy Lane 416 Marlboro Street, Boston for details

July 24-31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnitz. General Secretary Dr H. E. Walther Gloriastrasse 14 Zurich.

September 3-6—American Public Health Association, at Pasadena, California. Dr J. D. Dunshee, Chairman Local Committee on Arrangements

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw. For particulars address The National Tuberculosis Association, 450 Seventh Avenue New York, N. Y.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday March 7—Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker Dr Frank H. Lahey Boston. Subject to be announced Film Electrocardiogram

Wednesday April 4—Essex Sanatorium Middleton. Clinic 5 P.M. Dinner 7 P.M. Speakers Dr Elliott P. Joslin and Dr Howard F. Root, Boston. Subject Tuberculosis Complicating Diabetes.

Thursday, May 3—Censors Meeting at Salem Hospital, 3 30 P.M.

Tuesday, May 8—Annual Meeting Salem Country Club Forrest Street, Peabody. Dinner at 7. Speaker to be announced. Subject to be announced.

RALPH E. STONE M.D., Secretary

221 Cabot Street, Beverly Mass.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE M.D. Secretary
Sunderland Mass.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place in March (2nd Wednesday) at Wakefield and May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D., Secretary
76 Church Street, Winchester Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T. A. STAMAS M.D., Secretary
226 Central Street, Lowell Mass.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

February 20—Meeting at the Metropolitan State Hospital, Waltham, 5 P.M.

NORFOLK DISTRICT MEDICAL SOCIETY

February 27—Hotel Kenmore 8 30 P.M. Dr J. H. Shortell Industrial Medicine and Surgery

March 27—Faulkner Hospital, 8 30 P.M. Dr Henry H. Faxon and Dr Edward A. Edwards Symposium on Varicose Veins Discussion by Dr E. E. O'Neill.

April 17—Hotel Kenmore 8 30 P.M. Special Business Meeting

May—Annual Meeting Time place and program to be announced

FRANK S. CRUICKSHANK, M.D., Secretary
1695 Beacon Street, Brookline Mass.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker Dr Elliott P. Joslin. Subject Diabetes.

May 3—12 noon at Norfolk County Hospital. Annual Meeting Election of Officers

N. R. PILLSBURY M.D. Secretary
Norfolk County Hospital, South Braintree Mass.

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals.

April 25—Annual Meeting at the Boston Medical Library Election of Officers. Scientific Program titles and speakers to be announced.

The Medical Profession is cordially invited to attend all of these meetings

JAMES H. MEANS M.D., Vice-President.

GEORGE P. REYNOLDS M.D. Secretary
311 Beacon Street Boston, Mass.

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester Mass.

March 14—Dinner and scientific program at the Memorial Hospital, Worcester Mass.

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C. MILLER, M.D. Secretary
27 Elm Street, Worcester Mass.

BOOK REVIEWS

Diet and Personality Fitting Food to Type and Environment By L. JEAN BOGERT Published by The Macmillan Company 223 Pages Price \$2 00

The approval of Lafavette B. Mendel puts the dietetic principles and their practical application as found in this volume beyond possible criticism. In *Diet and Personality* the author has mixed sound fact with well reasoned common sense and an adequate dash of humor to produce a book which even the most cautious physician may well recommend to his patients. What higher praise?

Obstetrical Nursing By CAROLYN COYANT VAN BLARCOM Third Edition Published by The Macmillan Company 651 Pages Price \$3 00

The interesting and unique treatment of obstetrical nursing merits this third revision. It has been read with genuine enjoyment. The author has sincerely

THE MASSACHUSETTS PHYSIOTHERAPY ASSOCIATION

The Massachusetts Physiotherapy Association will meet at the Hotel Kenmore on February 13 at 8 00 P M Dr Richard M Smith will speak on the subject "The Cost of Medical Care"

BOSTON UNIVERSITY SCHOOL OF MEDICINE

WILL CONDUCT A CLINICAL MEETING AT
BOSTON CITY HOSPITAL

Dr E Starr Judd, Professor of Surgery, University of Minnesota School of Medicine and Surgeon at the Mayo Clinic, Rochester, Minnesota, will give a clinic in the Cheever Amphitheatre, Boston City Hospital, at 11 o'clock on Monday, April 16, under the auspices of the Department of Surgery of Boston University School of Medicine

His subject will be "Surgical Diseases of the Biliary Tract" Drs Horace Binney of the Boston City Hospital, Arthur W Allen of the Massachusetts General Hospital and Elliott C Cutler of the Peter Bent Brigham Hospital will take part in the discussion

Physicians and medical students are invited to attend

OTTO J HERMANN,
WILLIAM R MORRISON,
DWIGHT O'HARA,
*Committee on Clinics,
Boston City Hospital*

THE MALDEN MEDICAL SOCIETY

The next meeting will be held on February 20, at Malden Electric Co Hall, at 8 30 P M

Speaker Dean Warren Stearns

Subject Outline of Psychiatry

A. H WARREN, M D, *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, February 13, at 8 15 o'clock.

PROGRAM

Presentation of Cases Dr C F McKhann

The Mechanism of Salt Deficit in Chronic Nephritis By Dr A. M Butler

The Specific Treatment of Influenzal Meningitis By Dr L D Fothergill

Some Experiments in Iron Metabolism By Dr L. K. Diamond

JOHN HOMANS, M D, *Secretary*

MASSACHUSETTS GENERAL HOSPITAL

A Clinical Meeting of the Staff of the Massachusetts General Hospital will be held in the Moseley Memorial Building, on Thursday, February 15, 1934, at 10 15 P M

PROGRAM

1 Diagnosis of the Hemorrhagic Tendsructive Jaundice Dr R R Linton

2 Medical Significance of Gall Bladder Dr C M Jones

3 Surgical Aspect of Cholelithiasis and its Complications Dr L S McKittrick.

Physicians, medical students, nurses and hospital workers are cordially invited

Committee on Hospital

THE NEW ENGLAND ROENTGEN RAY

The February meeting will be held at the Medical Library, Friday night, February 24

SCIENTIFIC SESSION

"Radiography as Aid to Renal Tract Diagnosis" Dr Bryant D Wetherell, M D, Boston, M

T R HEALY, M D, *Secretary*

370 Marlborough Street,
Boston, Mass

NEW ENGLAND HEART ASSOCIATION

The fifth meeting of the New England Heart Association will be held in the Amphitheatre of Children's Hospital, Monday, February 26, at 8 P M

All members of the New England Heart Association and interested physicians are invited to attend

PAUL W EMERSON, M D *Secretary*

NEW ENGLAND SECTION OF THE ILLINOIS ENGINEERING SOCIETY

There will be a meeting of this Society on February 16, at 7 45 P M in the Amphitheatre Building C of the Harvard Medical School

Program Sunlight and Artificial Sunlight Health and Disease, by Dr E T Wyman
Experimental and Medical Applications of Ultraviolet Radiation Dr M J Dorcas

Members of the medical profession are cordially invited

D P STONE, *Secretary*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

February 9—Massachusetts Memorial Hospital page 341

February 9—William Harvey Society at the Beth Israel Hospital, at 8 P M Speaker Dr George Blume
Medical School Subject Bedside Diagnosis.

February 12—House Officers Association of the City Hospital. 8 P M Subject Endocrinology
Speakers Drs Albright, Rowe Cochrane Aub

February 12—Massachusetts Italian Medical Society See page 341

February 12, 13—Thirtieth Annual Congress on 1 Education Licensure and Hospitals See page 340

COURSE ON MEDICAL BIBLIOGRAPHY Boston Medical Library

February 13—Incunabula James F Ballard
Tuesday at 8 P M
Boston Medical Library 8 The Fenway

The New England Journal of Medicine

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NEW ENGLAND BRANCH, AMERICAN UROLOGICAL ASSOCIATION

GASTRO-INTESTINAL SYMPTOMS FROM LEFT RENAL TUMOR*

(Demonstration of Metastases Around Sympathetic Nerves Having
Renal and Gastric Associations)

BY CHANNING S. SWAN, M.D.†

H. L. Male aged 47 Entered the Medical Service of the Massachusetts General Hospital April 11, 1932 with a complaint of epigastric pain, weakness, and indigestion for ten months.

Present illness began with attacks of pain in "the pit of his stomach" fifteen to thirty minutes after he had had his lunch which was his heaviest daily meal. The attacks though lasting approximately but thirty seconds, were severe. A choking sensation forced him to stop walking. A feeling of numbness in his chest and arms with a sensation of being unable to breathe made him think each attack would kill him. He also had heartburn and hunger pains one hour to a half hour before meals. Five months ago he began to have severe constant pain in his lower lumbar region which extended down his legs. A diagnosis of thrombophlebitis of both legs was made in the Peripheral Circulatory Clinic. Four weeks ago he began to vomit five to ten minutes after meals. Once the vomitus was blood streaked. Recently several attacks of epigastric pain more severe and of longer duration than usual, were relieved only by vomiting. He had lost a good deal of weight. There were no urinary symptoms.

Examination showed a rather emaciated middle-aged man with a rather full appearing abdomen on which the superficial veins were prominent. In the left upper quadrant there was a non tender movable mass which extended nearly down to the umbilicus was about the size of a grapefruit, and moved with respiration. The blood pressure was 90/50. The N.P.N. was 26 mgs., the urine was negative, the stools had a positive guaiac reaction. The preliminary diagnosis on the Medical Service was carcinoma of the stomach. Carcinoma of the colon at the splenic flexure and hypernephroma were also mentioned.

X-ray studies of the gastro-intestinal tract were negative except for a pressure defect on the descending colon from an outside mass. Studies of the G.U. tract were then made both cystoscopically and by intravenous urography. The essential part of the x-ray report is as follows:

"The left kidney outline is not well seen but appears to be greatly enlarged, occupying the entire left upper quadrant. There is no dye visualized in the calices pelvis or ureter on the left side. After retrograde injection of the left side the pelvis and calices appear definitely abnormal. There is complete obliteration of the upper and middle calices and the lower major calyx is elongated. The appearance is consistent with a left renal tumor.

Dr. George Holmes, roentgenologist, advised against treating the tumor by radiation.

Operative treatment was admittedly probably hopeless but was decided upon chiefly because the patient and his family were anxious to have something done. Therefore on April 28, 1932, left nephrectomy and transfusion were done for hypernephroma. The tumor was even more extensive than suspected and was not entirely removed at operation. Invasion of the renal vein and regional lymph nodes was obvious.

Postoperatively the patient did very well until the



Sympathetic nerve enmeshed in metastatic tumor

fourteenth day when he began to run a picket-fence temperature and have chills of unknown cause. These continued to the seventeenth day when he became cyanotic and suddenly died while the House Officer was dressing his wound.

The postmortem examination revealed metastases to the retroperitoneal glands and lungs (these had not shown in a chest plate) and thrombosis of the renal vein and inferior vena cava with blood clot and tumor. Of especial interest, however, was the finding of metastatic lesions surrounding and impinging upon the sympathetic nerves that have mutual association with the kidney and gastro-intestinal tract.

Presented at the meeting of the New England Branch of the American Urological Association, May 15, 1933.

†Swan—Assistant Urologist, Massachusetts General Hospital. For record and address of author see "This Week's Issue" page 353.

emphasized the necessity for the simplification of nursing care both in the home and the hospital. The greater appreciation of the social implications of obstetrics is constantly urged upon the pupil. New developments in nutrition, roentgen pelvimetry, the physiology of gestation and the early diagnosis of pregnancy are fully discussed. The author develops her nursing creed in a unique introductory chapter on the "Meaning of Obstetric Nursing." The arrangement of the book, with many routine procedures in outline form makes it a work for easy consultation and the rich supply of definitions and adequate illustrations should lead every teacher of nursing to endorse it for her pupils.

Pediatrics By HENRY DWIGHT CHAPIN, M.D., and LAURENCE T. ROYSTER, M.D. Seventh Edition. Published by William Wood & Company. 775 Pages. Price \$7.00.

This edition contains 750 pages dealing with many phases and diseases of infancy and childhood. It is almost encyclopedic, but like most encyclopedias it passes over some points in a superficial, if not evasive manner. Had the authors confined themselves to a smaller variety of subjects their book would be more interesting and probably more accurate.

The chapter on tuberculosis is out of date in some respects. Pulmonary infection is said to originate in "the lymph glands at the bifurcation of the trachea." Although a page of words is devoted to prophylaxis there is nowhere an account of modern case-finding methods.

The discussion of exanthemata is largely academic. Neither tuberculosis nor arteriosclerosis is mentioned as a liability for the diabetic child. One must be hypercritical, however, to hold such omissions against what is essentially a good text for students, and reference for physicians. The reviewer feels, nevertheless, that approximately one-third of the material could be advantageously deleted.

Colds and Hay Fever By FRANK COKE. Published by William Wood & Company. 148 Pages. Price \$2.00.

This is an attractive little volume written in a light conversational way. It would appeal to any intelligent layman and makes good reading for the doctor.

Dr. Coke is an Englishman who has already written a book on Asthma and knows his subject. Like all of us he has his hobbies which he rides fast only to find that he must go back for details, and very often these are given, sometimes more sometimes less space than they deserve.

The normal functions of the nose are well described and then six pages are devoted to the physiology of the act of sneezing. The common cold is treated in its economic and hygienic aspects but Dochez' brilliant work with the virus deserves much more space. In hay fever and the allergic cause of sneezing, the author is evidently not quite convinced

that allergy can explain the whole clinical picture. "Ionization," cautery and sprays must be used in addition. We know, however, that the great interest in allergy developed in America is not so highly developed on the other side. Dr. Coke is interested in the French conception of a disturbance of the colloidal particles in the blood and believes "paroxysmal rhinitis" may have such a cause. He advises intravenous doses of "colossal manganese" as well as ionization of the nose by electricity.

As a whole, the book is worth while. Another time, however, the arrangement could be improved and the space divided to better advantage.

Food Products By HENRY C. SHERMAN. Third Edition. Published by The Macmillan Company. 674 Pages. Price \$3.00.

A third edition of Dr. Sherman's book on food products is a valuable addition to the literature on nutrition. The subject is presented in an orderly and readily accessible form, for most of the text describes special foods as milk and milk products, eggs, fish and game, meats, the products of grain, vegetables, nuts, fruits, etc. In these chapters the production and marketing, the standards of purity according to the sanitary laws, and the composition, mineral and vitamin content, the digestibility, nutritive value and use of these foods are described. In other chapters, the general aspects of nutrition, the constituents, functions and control of food and food economics are explained. In the appendix, the regulations of the Food and Drugs Act, as well as those of meat inspection are given. An unusual and valuable addition to each chapter is a list of books and articles for further study or better comprehension of the subject. A few references are also given. The text is illustrated by some good pictures and is clarified by many tables. The style of writing is easy, yet accurate and the type is good. The book should be especially valuable for dietitians, and also for physicians and lay workers in nutrition.

Behind the Doctor By LOGAN CLENDENING. New York: Alfred A. Knopf, 1933. xxi + 458 + xi pages. Price \$3.75.

Of the popular books on medical history published in the last few years the book under consideration seems to the reviewer to be one of the best. The subject has been taken up in a lively and entertaining manner. Dr. Clendenning has dramatized some of the important events in medical history, using as a background the actual contemporary publications. By this method basing his work on sound conclusions, he presents a picture of historical events in a successful manner. The book is full of interesting material and splendid illustrations. It ought to have a wide appeal to the general public as well as to the medical profession. One or two minor errors were noticed, but these are easily offset by the general tone of the whole publication.

Eighteenth day Another blood culture is positive for the bacillus mucosus capsulatus. Cultures and smears of the sputum, nose and throat failed to show any bacillus mucosus capsulatus. Urine cultures were negative for the organism. Unfortunately no special stains were done on the organisms found by smear in the sediment of the urine. They were thought to be colon bacilli.

Nineteenth day His condition has become progressively worse. The high septic type of temperature continued. The patient suddenly became pulseless, and his blood pressure dropped. He became cold and clammy, and five minutes later expired.

A postmortem was obtained. The heart was found hypertrophied and dilated. The lungs were congested and there was no distinct consolidation. The spleen was enlarged. Both kidneys were swollen, hyperemic and soft. The right kidney weighed 360 grams. On the lateral border of the right kidney were two large superficial abscesses which coalesced into a serpentine area measuring 5 x 3 cm, and extended into the kidney for 15 cm. There were numerous small abscesses, one to several millimeters in diameter scattered over the kidney especially on the lateral side. At the upper pole was an abscessed area, measuring 4.5 x 3.5 x 1.5 cm, which extended down to the upper calyx, but did not involve the mucosa of the pelvis. The left kidney weighed 260 grams. There were no definite abscesses observed grossly. The pelvis and calyces had a smooth and shiny mucosa. The pelves were not dilated, and the ureters were negative. Microscopic examination of sections of both kidneys showed numerous foci of dense polymorphonuclear leucocytic infiltration and slighter lymphocytic infiltration, the foci being of various sizes and stages of development. There were also areas showing varying degrees of necrosis and degeneration of the parenchymal elements.

The entire bladder wall was thickened and fibrosed. The mucosa was congested swollen and edematous especially at the trigone. Microscopic examination of sections of the bladder showed an intense degree of edema together with varying degrees of lymphocytic infiltration, and dilatation and hyperemia of the blood vessels. The picture here, was essentially that of a chronic reaction.

The prostate was pallid in color patulous and somewhat irregular. The cut surface was frothy firm and somewhat elastic. The urethral surface was very red congested, and firm. The prostatic urethra appeared to be adequate for urination. Microscopic examination revealed an overgrowth of connective tissue and a reduction in the number of prostatic glands. Many of the gland lumina contained desquamated necrotic cells. The fibrous connective tissue was edematous and the seat of a diffuse lymphocytic infiltration. Special staining of the tissue failed to disclose any bacillus mucosus capsulatus.

The anatomical diagnoses were as follows:

- Multiple abscesses of kidney
- Splenomegaly
- Cardiac hypertrophy and dilatation
- Congestion and edema of lungs
- Chronic cystitis and proctitis
- Hyperplastic prostate

REMARKS

The bacillus mucosus capsulatus is a group of a number of species or varieties of organisms having many similar characteristics. One member of this group was first isolated and described

by Friedländer. The organism is encapsulated, gram negative, non-motile, and is found in five to twenty per cent of the noses and throats of healthy people. Under ordinary conditions it is saprophytic, but becomes pathogenic when its virulence is increased, or the resistance of the host diminished.

There have been reported in the literature only fifty-one cases of septicemia, with the bacillus mucosus capsulatus, of which only three recovered. The clinical course of these patients with septicemia is characterized by extremely elevated temperatures, and often local processes may dominate the clinical picture. Wehrsig reported a case of septicemia in which operation was performed on the kidney for metastatic abscesses. Our patient had definite renal pain and costo-vertebral tenderness, and the finding at post-mortem of renal abscesses is consistent with this observation.

The bacillus mucosus capsulatus has been reported a number of times in diseases of the genito-urinary tract. Warburg in 1899 reported a case of bacteriuria. Etienne, in the same year, cited a case of pyelonephritis. Montt-Saavedro in 1896 reported a case of cystitis. In the same year Halban reported a case of abscess of the scrotum, and Macaigne and Vanverts, a case of peri-deferential abscess. Schenk also reported a case of salpingitis.

I am able to locate in the literature only two cases of septicemia with this organism from a primary focus in the urinary tract. Wolf reported a fatal case of septicemia following a cystitis. Hyman and Edelman, out of a series of sixty-four positive blood cultures on cases of urinary tract disease, isolated one case infected with the bacillus mucosus capsulatus. This was a postoperative infection in a man sixty-eight years old. He began to void on the seventh day after incision and drainage of a prostatic abscess. He immediately developed chills and fever, which terminated fatally.

In Scott's report of a series of eighty-two positive blood cultures on a Urological Service, there were no infections with this organism. However in forty per cent of the cases, the bacillus coli was found, with a mortality of eighteen per cent. Hyman and Edelman in their series found forty-five cases of bacillary and nineteen cases of coccal infections with a mortality of twenty per cent, and sixty-eight and four-tenths per cent respectively. The mortality of septicemia with the bacillus mucosus capsulatus is about ninety-five per cent.

It has been definitely shown that bacteremia and septicemia follow urethral manipulation. Scott reported that in sixty (80%) of the cases, the portal of entry was the urethra, of which twelve cases followed a retention catheter, five followed catheterization, and ten followed cystoscopy. Hyman and Edelman concluded that

Many writers have brought to our attention the fact that gastrointestinal symptoms may be due to renal pathology other than of the acute infectious or uremic type. Commonly however the renal lesion is on the right side and often causes the gastrointestinal symptoms by direct pressure on the duodenum as might be caused by a large hydro-nephrosis, movable kidney, or renal tumor. Gastrointestinal x-ray studies not infrequently reveal filling defects due to extrinsic pressure on the duodenum, stomach, or gall bladder.

In other cases pressure is not the cause of symptoms. The phenomenon of viscerovisceral reflexes through sympathetic nerves having both renal and gastrointestinal associations has been called upon to explain the G-I symptoms manifested by GU pathology. The celiac plexus by its connections with the splanchnic nerves and the vagus nerves is the main center of communication. Gray's anatomy states, "The upper part of each celiac ganglion mak-

ing up the celiac plexus is joined by the greater splanchnic nerve, while the lower part, which is segmented off and named the aorticorenal ganglion, receives the lesser splanchnic nerve and gives off the greater part of the renal plexus." Secondary plexuses springing from or connected with the celiac plexus include the superior gastric, the superior and inferior mesenteric, the suprarenal, the renal and others. The interlocking relationship is thus obvious. Generally nothing concrete is found at operation or autopsy to demonstrate why the gastrointestinal symptoms in a given case should have come from the renal pathology through the sympathetic nerves, but in this case there was found and I am able to demonstrate slides to you showing the sympathetic nerves of the region previously described definitely surrounded and impinged upon by metastatic renal tumor cells. The cause of the gastro-intestinal symptoms from the renal pathology is therefore in this case concretely demonstrated.

A FATAL CASE OF SEPTICEMIA DUE TO THE PNEUMO-BACILLUS OF FRIEDLANDER, FOLLOWING TRANSURETHRAL PROSTATOTOMY*

BY M. LEOPOLD BRODNY, M.D.†

THE following case history is reported for two reasons. First, the patient presents a fatal complication following transurethral prostatotomy, secondly, the infecting organism in the case is rare in the genito-urinary tract, and especially as a causative agent of septicemia.

Mr. M. K., aged 63, was admitted to the hospital complaining of difficulty in starting his stream, urgency, frequency, nocturia, and burning on urination. His symptoms were of one year's duration, and were progressively increasing in severity. For eight months he was treated by a physician with bladder washes and prostatic massages without any improvement of symptoms.

He was under medical treatment for diabetes, hypertension, and paroxysmal auricular fibrillation, and was symptomatically doing fairly well.

Physical examination revealed an obese individual with a large heart, a systolic murmur at the apex, and a grossly irregular pulse. The blood pressure was 210/110. The lungs, abdomen and extremities did not show any marked variation from the normal. On rectal examination the prostate was found to be slightly smaller than normal, smooth and boggy. The median sulcus was faintly felt, the right seminal vesicle was palpable.

The bladder residual varied from two to eight ounces. The urine contained the slightest possible trace of albumin, and the sediment per high powered field showed three to five white blood corpuscles, an occasional red blood corpuscle, and many organisms which resembled bacillus coli. The non-protein nitrogen varied from 20 to 28 milligrams per 100 cc of blood. The blood sugar was within normal limits and the Wassermann was negative. The cystogram and the urethrogram were consistent with a small obstructive prostate.

The patient was placed on constant urethral drainage for six days. A bilateral vasectomy and a transurethral prostatic resection were done, and the

patient was left on urethral drainage. The operation was not difficult, and there were no operative complications.

PROGRESS NOTES

First day. The urine is pale pink. There is no vesicle hemorrhage. The general condition is good, and he is taking fluids well. The output is satisfactory.

Third day. The urethral catheter was removed this morning. His diabetes is under control. The blood pressure is 200/110. The patient had a slight chill two hours after catheter removal, and the temperature rose to 103°.

Fifth day. The patient was unable to void yesterday, and was placed back on constant drainage. The temperature is lower. His heart started to fibrillate, so the amount of digitalis was increased.

Ninth day. The temperature chart has a septic curve. Patient has had a few mild chills which were of short duration. A blood culture is negative. Urine is loaded with pus, and many bacteria which resemble *Bacillus coli*. The heart has stopped fibrillating. His fluid intake is 175 oz and his output 85 oz. He complains of pain and marked tenderness in both costovertebral angles.

Thirteenth day. The temperature has risen to 105°, and the patient appears very toxic and ill. He is taking fluids poorly by mouth, so subcutaneous infusions are given. There are a few fine rales at both bases. The urine is still loaded with pus and bacteria. His non-protein nitrogen is 29. The diabetes has become difficult to control, and his blood sugar has risen to 215 mg per 100 cc of blood. (The blood culture taken on the twelfth postoperative day was positive after six days for the *Bacillus mucosus capsulatus*) (Friedländer's *Bacillus*).

Sixteenth day. The base of the right lung is consolidated and there are moist rales at both bases. He had marked abdominal distention, which was treated by pituitrin and flaxseed poultices successfully. The patient's general condition is essentially worse. He still complains of pain in both costovertebral angles.

*From the Urological Service of the Beth Israel Hospital, Boston, Mass.

Read at the meeting of the New England Branch of the American Urological Association, May 13, 1933.

†Brodny—Assistant Urologist, Out Patient Department, Beth Israel Hospital, Boston. For record and address of author see "This Week's Issue," page 338.

EXPERIENCES WITH PROSTATIC RESECTION*

BY J. DELLINGER BARNEY, M.D.†

UP to this time fifty-six resections for bladder neck obstruction have been done at the Massachusetts General Hospital, twenty-four at The Baker Memorial thirty-two in the General Hospital. More cases could have been resected were it not for the fact that very careful selection has been made, and only those cases taken which seemed to be entirely suited to resection. Of the fifty-six cases I have operated on thirty-six, the other twenty have been operated by my colleagues on the service.

Thirty-three cases were benign adenomas twenty-one were cancers one a fibrosis following suprapubic prostatectomy, and one unclassified.

The total mortality was 17.8 per cent. Among the cases at The Baker Memorial of which there were twenty-four, there was only one death. Of the thirty-two cases at the General Hospital, nine died. Four of the patients who died had benign adenomatous prostates, the other six had malignant growths.

The age of the patients, their symptoms and their condition on entering the hospital corresponded with that of any similar number of cases on which a prostatectomy would be indicated. The youngest was fifty-one, the oldest eighty-six.

Preoperative drainage was carried out for an average of eleven and a half days, the longest continuing for forty-one days, the shortest for two days there being seven of these. In all respects these cases were studied and prepared for operation as thoroughly and carefully as they would be for prostatectomy. Preoperative study showed the same variety of other pathological conditions as one would find in any similar number of prostatitis.

For various reasons the chief being undoubtedly inexperience much less tissue was removed in most of the patients than is usually the case if one is to go by the reports of other writers. In no instance did the excised tissue amount to more than five grams, in most it was much less.

The first two or three cases were done with the Davis resectoscope, all others with the McCarthv instrument. A variety of electrical units have been used, both the spark-gap and tube machines, but most of the work has been done with a spark-gap unit. While it certainly induces less initial hemorrhage and effects its control much more readily than the tube machines, there is no doubt that the latter cuts more cleanly and quickly.

After operation there was no bleeding at all in twenty-six cases, in fifteen others the urine was definitely bloody for from one to three or four days. One case had no bleeding till the twenty-fifth day when he had a massive hemorrhage from which he died eventually.

Seventeen cases were entirely afebrile a few ran temperatures up to 100° for a few days. Certain others continued to run a temperature for from twelve to thirty-one days. Twelve cases had from one to five or six chills these occurring anywhere from the first to the fortieth day.

Postoperative drainage averaged eight days, the shortest being one day, the longest twenty-four days. Days in bed averaged about ten, ranging from two to forty-four. Days in the hospital after operation averaged fifteen, the shortest three, the longest eighty-four.

The residual urine at the time of discharge averaged two and a half ounces, but the amount varied from none at all in ten patients to eighteen ounces in one. As nineteen of these patients entered the hospital with complete retention of urine, and as these patients were relieved of this condition, it would appear that resection had been at least to a certain extent successful. But it is felt that the measurement of residual urine so soon after operation is inaccurate, especially in those cases where there is a considerable amount. After any such procedure as resection there is always a widespread and marked inflammatory reaction of the structures at the neck of the bladder. This will subside with the lapse of time, and less or no residual will be found. While this statement is partly true, it is modified by certain cases which subsequent examination showed to be unimproved.

Various complications followed resection in a good many cases, although there were none at all in twenty-nine. Among the complications there occurred pyelitis of greater or less severity, scrotal abscess, epididymitis, periurethral abscess, paraphimosis, pneumonia, collapse of the lung, uremia, phlebitis and pulmonary embolism. There were three severe postoperative hemorrhages, one the day after operation relieved by palliative treatment, one which required cystoscopy and subsequent prostatectomy, and one beginning twenty-five days after operation which was relieved by cystostomy, but eventually ended fatally.

Although it is impossible at this time to speak of ultimate results, certain more immediate effects of these resections are known. It has been stated already that ten cases, six of which had cancer, died in the hospital. An autopsy was obtained in nine. Six more have died since

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the greater number of infections coming under their observation were due to some form of urethral instrumentation, or were postoperative in origin. It will be interesting in view of the large number of positive blood cultures following merely catheterization or cystoscopy to observe what effect the traumatization and coagulation of the prostatic urethra, during transurethral prostatic resection, will have on the incidence of hematogenous infection.

Infections following prostatic resection have been given very minor consideration by some enthusiasts of the procedure. Davis believes that the "lymph channels and blood vessels are sealed by the coagulation incident to hemostasis", and that "postoperative infection has been of negligible frequency". Collings reported one hundred and fifty private cases of transurethral operation and only "two patients had a urethral chill following operation, with temperature elevation to 103 and 104 degrees F". "The temperatures went down by lysis probably indicative of a transitory kidney infection."

On the other hand many authorities have found infection a most important factor. Bumpus reported six deaths in two hundred and fifty prostatic resections, and believed that sepsis was the main causative factor in all of them. Alcock reported that in his first fifty cases practically all of the patients showed a reaction. In over sixty per cent of them the reactions were quite violent, as manifested by chills and temperature from 101 to 104 degrees, lasting from two to five days. Day was of the opinion that multiple abscesses of the kidney, not hemorrhage, make up the complication that is most apt to cause death after resection. Colby, commenting on Barney's report of the transurethral resections done at the Massachusetts General Hospital brought out the fact that thirty per cent of the autopsies showed sepsis as the cause of death. Ockerblad, in a personal communication to Lewis, reported a death from septicemia six weeks after resection. The organism is not named. A. E. Goldstein reported a death from generalized streptococcus hemolyticus infection five days after operation. Lewis, quoting from a questionnaire which he sent out to a number of urologists, noted that systemic infection appeared in the records of a large number (twenty, or more) of operators as a source of trouble or even death.

I believe that since the prostatic urethra is prone to give rise to hematogenous infections, the trauma of resection and the necessary cauterization for hemostasis will produce in many cases such conditions as will establish foci for blood stream invasion.

CONCLUSIONS

- 1 Septicemia with the bacillus mucosus cap sulatus is rare
- 2 The patient with this infection carries an extremely poor prognosis
- 3 The incidence of blood stream infection as a complication of transurethral resection will bear watching

I wish to thank Dr E Granville Crabtree for permission to report this case

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DISCUSSION

DR. SMITH Since Dr Brodny's communication is directly in line with the symposium we have tonight, I think we might go on with that.

The subject of prostatic resection is really a very important one. The amount of literature which has been put forth on this subject is already considerable. There has been a great deal of interest expressed in this method by the medical profession and by those men who are in the prostatic age. It falls upon us as the representatives of urology in New England to canvass this situation thoroughly and to honestly and fearlessly put to this Society the results which we have had with this method of treatment.

We have tonight, four papers bearing on this subject and the first is by Dr Barney.

for the operation is a very definite and important factor in doing further damage to kidney function

"I do not believe that transurethral resection is necessarily the best procedure in the old and feeble individual, this being contrary to the beliefs of some of my colleagues. I believe that such individuals are much better off with a simple suprapubic cystotomy with an in-dwelling suprapubic catheter. If and when their condition improves, the obstruction at the bladder neck can be done away with, either by the use of the cold punch such as has been devised by Young, or by one or the other of the more recent types of electric resection instruments. Nor should one forget that a suprapubic prostatectomy may be an even safer procedure. Every case which does not at first seem suitable for resection because of poor general condition or because of local conditions such as infection and edema, should have a preliminary cystotomy. At this time the cystoscopic findings can be checked up by actual visual inspection of the obstruction at the bladder neck as well as by palpation. Even the most experienced cystoscopist will sometimes find that what he saw through the cystoscope is very different from what actually exists when seen from above. In most cases, especially the old and feeble patients, a bilateral vasectomy done under local anesthesia should be a routine. There is no question but what transurethral resection sets in motion a chain of infection which sooner or later will find its way to the testicle or epididymis, and we all know that in a greatly debilitated patient the onset of such an infection, leading perhaps to still further surgery, is sometimes fatal. I believe also that an intravenous pyelogram or certainly a flat x-ray plate of the urinary tract should be done. In the first place it gives most valuable evidence of the status of the kidneys, and in certain cases will reveal conditions such as stone or even tumor which were not hitherto suspected, and the presence of which might entirely alter one's procedure.

"In a certain number of cases, especially the younger patient with a clean urine and very little residual urine, preoperative drainage either by catheter or by suprapubic cystotomy is not only unnecessary but it is often unwise. Drainage of either type is bound to produce or to aggravate infection and after all we all prefer to operate in an uninfected field so far as this is possible. While I do not advocate dispensing with preoperative drainage in any but those who are in first-class condition, I feel it important to emphasize my belief that it is not always one of the essential routine procedures.

"In my experience transurethral resection often brings in its train certain definite postoperative complications. Far and away the most important of these is infection. Hemorrhage comes next in order of frequency, and finally circulatory disturbances.

"As regards the ultimate results of transurethral surgery of the bladder neck I believe that the elapse of time will give us the correct answer. I think we can be sure that this type of operation is admirably suited for the relief of obstruction due to carcinoma. While no one will claim for a moment that it will cure carcinoma, I think we are all convinced that it will bring relief for a considerable length of time, and personally it has been my experience that resection can be performed two and perhaps three or more times if and when obstruction recurs. I believe also that transurethral surgery is likely to cure permanently, when properly done, the patient with postoperative fibrosis. In other conditions the ultimate results must be watched over a considerable period of time before we can say that this is without doubt the best method of attack. I believe that at our meeting three years hence the results of the surgery which we have heard described at the present meeting will furnish the most valuable test of its virtue. I hope that such a report can somehow be made."

TRANSURETHRAL RESECTION OF THE PROSTATE*

BY ROGER C. GRAVES, M.D. †

OUR first experiences with transurethral resection at the Carney Hospital have convinced me that it is an invaluable addition to prostatic surgery. Its faults which have been so deplored by some may be ascribed in large measure, I believe, to a natural inexperience with a new technique, or to inadequate electrical equipment, or to the improper selection of cases which so often occurs in the initial period of enthusiasm following the introduction of a new

procedure. It is not a panacea for all prostatic ills, and it is not a complete substitute for prostatectomy. I still feel sure that the best treatment for the average patient with large benign hypertrophy lies in a suprapubic or perineal enucleation of the whole gland, as we have done routinely in the past. In the long run, this will offer a more certain and permanent removal of residual urine as well as less infection, and it will eliminate the bulk of the prostate for some who might otherwise go on to the development of malignant disease if this tissue were allowed to remain. There has been too great a tendency in recent years, especially in our

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leaving the hospital, and of these, four had cancer. The highest mortality has been among those having malignant disease of the prostate, but it is a fact that these patients were all far advanced in their malignancy and in wretched condition.

The results up to date of those living vary so widely that no adequate summarization can be made. Most of the malignant cases have been greatly relieved in that they void comfortably with no undue frequency or dysuria. The benign cases have with few exceptions fared extremely well. Retention, difficulty of urination, dysuria and frequency, the chief complaints before operation, have been eliminated entirely or greatly improved. While it is to be expected that some of these will still further improve, and that others will hold the gain they have made, we fully expect that certain others will retrogress and require further operative procedures. My experience with these cases has taught me that the view of the prostate obtained by the cystoscope and panendoscope is often very misleading. Cystotomy on some of them before or after resection has shown a very different picture of the prostate from that obtained by instrumental inspection. This fact may possibly account for certain poor results.

We were fortunate in obtaining an autopsy on so many of our fatal cases. Two had a pulmonary embolus, a catastrophe in no way peculiar to the operation of resection. The others died of a variety of complications. It is interesting, however, to note that all showed evidences of severe and widespread infection of the prostate and periprostatic tissue, seminal vesicles, bladder and urethra. It was obvious that deep and severe necrosis of the tissues at the site of resection had given rise to this infection, and that it had overwhelmed the patient by its severity. Nor were we able, even when this infection was recognized before death, to influence its progress, except in a few instances, by any means at our command.

It has been pointed out that we studied and prepared each case before operation with the utmost care. It is also true that each case was selected as being suitable for resection for the reason that the obstruction was due not to large lateral lobes but to small median lobes, median bars, carcinoma or atrophic fibrous prostates. Furthermore each case was given the most painstaking and meticulous postoperative care with a view to avoiding the very complications from which many of them suffered. These complications arose in spite of every effort for their prevention.

It is only reasonable to ask if certain features of the operative technic are not to blame for the complications and deaths. I think they are. The use of too much current, too slow an excu-

sion of the electrode through the prostate, traumatism before or during resection with the sheath of the resectoscope, these and probably other equally important but still unrecognized factors must be seriously considered. The type of unit, whether spark-gap or tube, employed seems to me of no importance in the final results, yet I cannot avoid the feeling that the tube machine may cause less extensive and less deep-seated necrosis than that produced by one of the spark-gap type. This, however, is a matter for debate.

A feature which is interesting and of the utmost importance is that the mortality among twenty-four private cases at The Baker Memorial was only 4.16 per cent, whereas among thirty-two cases in the wards of the General Hospital the death rate was 28.1 per cent. Every case received identical preoperative study and preparation, resection was done with the same apparatus, postoperative care was as meticulous in one group as the other. While it may not be the fact, all I can offer as an explanation of the discrepancy in the mortality is that two very different types of individuals were dealt with, one with generally good background of hygiene, education, nutrition, etc., the other for the most part entirely lacking these important factors.

The following remarks, forming a part of my discussion of the question of "Surgery of the Neck of the Bladder" which was considered at the last meeting of the International Urological Society in London in July, although written since the preceding portion of this paper was read, summarize my opinion of the operation quite adequately.

"In the first place I am strongly of the opinion that this resection can be not only satisfactorily but safely performed under spinal anesthesia. While general anesthesia in the form of gas-oxygen or gas-oxygen ether is often used and even works well, it is to be remembered that in the cases requiring surgery of the bladder neck there is more or less kidney damage and that general anesthetics still further reduce kidney function.

"Transurethral resection in my judgment is to be confined largely, if not entirely, to cases of carcinoma of the prostate, median bar formation, early and small midlobe development, fibrosis following perhaps a suprapubic prostatectomy, and to the atrophic, fibrous prostate. I do not believe that transurethral resection should be attempted in the presence of lateral lobe enlargement unless it be of very slight development. My objection to this is largely based upon an experience of hemorrhage and infection, to say nothing of the greater length of time required for the complete removal of lateral lobe tissue. If the patient is under a general anesthetic, the additional length of time required

urethral resection. The program of aftercare has not been adhered to faithfully by the patient in this instance but when he was last seen, September 1, 1932 he was feeling well and had approximately two to three oz of residual urine.

In all of our cases, we have used the equipment advocated by McCarthy, including the electrotome, with wholly satisfactory results. When, in the earlier cases, the resection was less complete than might be, the fault has lain usually with the inexperience and timidity of the operator rather than with the instrument. I doubt, however, that it can be expected to function uniformly in all cases and I am sure that the best interests of our patients will not be served by placing this procedure on an itinerant basis. Transurethral resection is major surgery not because of any inherent difficulty in the method but because of the brittle character of the subject and the potential dangers involved. It should not be performed except under conditions which permit experienced supervision and trained assistance, not only during the operation but before it is undertaken and throughout the convalescence as well.

So much has already been written upon this subject that it is no longer necessary to emphasize the fact that the preparation of the patient for transurethral surgery should be just as meticulous as in the case of prostatectomy. Moreover, the same criteria of operability, based chiefly on long-established standards of circulatory and renal values, should be adhered to. It is especially important, also, in this connection, to eliminate or reduce as much as possible the element of infection in the bladder, for I do not believe that transurethral methods should be employed when there is marked infection, particularly of the alkaline type. Preliminary drainage of course may be by urethral catheter or suprapubic tube with or without gradual decompression, but in either event it seems best to forestall the development of epididymitis by routine ligation and partial excision of the vasa.

Before the patient comes to the operating room it is well to irrigate both the bladder and the urethra with a bland antiseptic solution. We have used spinal anesthesia or sacral and parasacral anesthesia in all of our cases. Care should be taken to maintain a rigid aseptic technique throughout the whole procedure. We have found that it lessens trauma and initial bleeding to carefully pass sounds gradually increased in size to number thirty before introducing the resectoscope.

The actual resection, of course, will always vary with the needs of the individual case and it can never be standardized in terms of the amount of tissue removed. We should endeavor so far as safe to render the urethral floor flush with the floor of the bladder to facilitate bladder emptying, and remove so far as possible the obstructive tissue around the vesical outlet par-

ticularly in the posterior quadrants. One should resect also the intraurethral obstructions until an open tunnel has been formed between the internal sphincter and the level of the verumontanum. Beyond this, we have been warned, it is not safe to go.

When the operation has been completed and bleeding satisfactorily controlled, our cases are kept on constant catheter drainage with frequent irrigations, for the first twelve hours or longer. Boric acid solution sometimes containing ephedrin is used as the irrigating fluid. The catheter is left in position for from two days to two weeks or more, usually from four to six days. As yet we have not had a patient fail to resume normal voiding, several had complete retention before operation. In the cases which are slow to regain this function, it has been found helpful to replace the catheter at night for a time, to lessen the load on the kidneys, removing it again in the morning. When constant drainage has been abandoned finally, antiseptic irrigations using a small catheter to avoid trauma and fresh bleeding, should be given daily at first, and then at gradually widening intervals depending upon the needs of the given case. It is well to pass a sound after six weeks or two months, and perhaps occasionally thereafter.

The stay in the hospital after operation in most cases will probably be found to average from ten days to two weeks. Continued care in the office is always advised when the patient leaves.

Thus far, in our small series, we have had no fatality. One patient, apparently in good condition died suddenly of an acute cardiac lesion while on catheter drainage in preparation for the transurethral operation. There has been no serious postoperative bleeding and only one patient has been seriously ill. That patient, who was uremic and in an extremely poor state at the time of admission, suffered a recurrence of uremic symptoms after operation, and what was probably an acute pyelonephritis superimposed upon marked preëxisting renal damage. He may have had also the localized infection within the prostate which has been so much talked about, we were not able to detect signs of it, rectally. He recovered finally and left the hospital with a good immediate result.

In closing it may be said that our experiences with this new procedure have been highly satisfactory, especially so in view of the fact that it happens that most of our patients have been in such poor condition at the time of admission, that several of them at least would have had to be content with medical care or permanent suprapubic cystostomy before the advent of transurethral resection. Even the persistence of cloudy urine and varying amounts of residual, less with improved technique, does not lessen the satisfaction found in obtaining marked ameliora-

own field, to supplant established surgical practices with manipulative methods, and transurethral resection is a case in point. Valuable as I am convinced that it is, it has in my opinion limited and clear-cut indications for its use. These may be classified broadly in three groups of cases as follows:

First, the relatively small, circumscribed obstructions at the bladder neck which we recognize usually as fibrous or glandular median bars. The true, rounded middle lobe hypertrophy before it has progressed to extreme enlargement with marked elevation of the urethral floor, may be included in this group. Secondly, those obstructed cases of carcinoma too advanced for complete perineal extirpation, in which it is desired to restore normal bladder function without more extensive surgery. In such cases where the malignant process is only moderately advanced, transurethral resection combined with radium introduced into the prostate through the perineum, offers an excellent therapeutic program. Thirdly, those cases of benign hypertrophy with marked or complete retention, in which the general degenerative changes, particularly in the circulation and kidneys, are such as to render the patient unfit for safe prostatectomy by any other method. This is the dangerous group in which we must proceed with the greatest care, whatever the plan of treatment, in the effort to maintain reasonably satisfactory bladder function with a minimum of risk. While in general I do not believe in the transurethral resection of the ordinary benign hypertrophied prostate, there are certain individuals properly falling into this badly damaged group, for whom the method may serve as a most fortunate solution of their difficulties.

Three case histories, illustrative of these three groups, may be very briefly reviewed at this time.

CASE 1. The median bar. Mr. L. Z., aged 53, complained of slowness in starting the urinary stream and dribbling, of two years' duration. Examination revealed a moderately large, soft prostate, in which there was evidence of early benign hypertrophy. Cystoscopy revealed a definite median prostatic bar of the fibrous type, sufficiently marked to completely hide the trigone when the cystoscope was withdrawn into the urethra. Reflexes normal. Blood pressure 160/90. Wassermann negative. Patient admitted to the hospital November 15, 1932. No residual urine and no preliminary catheter drainage. After a few days of general medical care, transurethral resection was performed on November 19th. The catheter was removed on the second day. On the day following there was a sharp rise in temperature which quickly fell to normal within twenty-four hours. Apart from this there was no complication, and the patient left the hospital in good condition, six days after operation. He was last seen before leaving for the South, on December 15, 1932. At that time the surgical result was highly satisfactory and the patient was much pleased. The urine was clearing and there was no residual.

CASE 2. Carcinoma. Mr. J. T. was a frail old gentleman of 70 who complained of dysuria and

marked increased frequency of urination. There was a strong family history of cancer. Examination found the clinical signs of moderately advanced carcinoma of the prostate, without metastases. Admitted to the hospital December 7, 1931. Following vasectomy and the establishment of constant catheter drainage, there occurred a series of complications which rendered further surgical measures impossible. The patient developed an acute pleurisy, followed by phlebitis, and a persistent bilateral pyelitis. There were signs also of a serious chronic myocarditis which responded but little to the administration of digitalis. Occasionally the urethral catheter was removed in the hope that the patient might void normally and so avoid the need for further treatment, but each time it was necessary to reinsert it. For many weeks it was felt impossible to consider surgery or even anesthesia. Finally, transurethral resection under sacral and parasacral anesthesia was performed on March 22, 1932, 106 days after admission. At the same time platinum seeds of radium emanation were implanted in the prostate by means of needle applicators introduced through the skin of the intact perineum. Total radium dosage 2112 mc. hours. April 6, 1932, two weeks later, the patient left the hospital voiding normally. The postoperative convalescence had been uneventful. Continued observation was necessary of course over a long period in this case, but when the patient was last seen a month or so ago, he was up and about and in excellent condition, with approximately two oz. of residual urine. Rectally the prostatic process shows no advance. This patient returned for examination in Nov. 1933, 6 mos. after the above report was written. There was then evidence of some advance in the local process, marked by extension of induration in the region of the left seminal vesicle. There was more than 8 oz. of residual urine. It was thought unwise to completely empty the bladder. Further transurethral surgery was advised. I might say also in connection with this case, that I believe it to be preferable not to carry out the radium implantation and the transurethral resection on the same day. It is our usual routine whenever possible, to allow several weeks to elapse between the two procedures, so as not to combine the local effects of radium and electrocoagulation in the prostatic substance at the same time.

CASE 3. Large benign hypertrophy of the prostate, in a patient unable to withstand prostatectomy. Mr. H. B., aged 67, was seen in July 1932, at which time he complained of hematuria and marked increased frequency of urination during both day and night. There were also dyspnea and edema. He had been examined a year and one-half before and at that time, with urinary symptoms less urgent, anything more than medical care had been advised against because of obesity and hypertension with probable chronic nephritis. In July, 1932 the weight was 245, and the general condition very poor. There were rales at the pulmonary bases. The previously elevated blood pressure had dropped to 132/64. The heart was reported enlarged and murmurs were heard in the mitral and aortic areas. The urine was bloody. Rectal examination found a benign enlargement of the prostate, above the left lobe of which one could not reach. There was a large amount of cloudy residual urine. Transurethral resection was performed on August 4, 1932, after a period of preliminary catheter drainage. Spinal anesthesia was used. This patient was very difficult to care for from the beginning. The urethral catheter was not borne well either before or after operation and there was troublesome abdominal distention. During the first few postoperative days he was clouded mentally. He was able to leave the hospital, however, voiding satisfactorily 11 days after trans

obstructing tissue rests on logical ground and Bumpus so aptly covers this point when he states—"It endeavors to correct obstruction by removal of the obstruction only, and not remove tissue that does not obstruct."

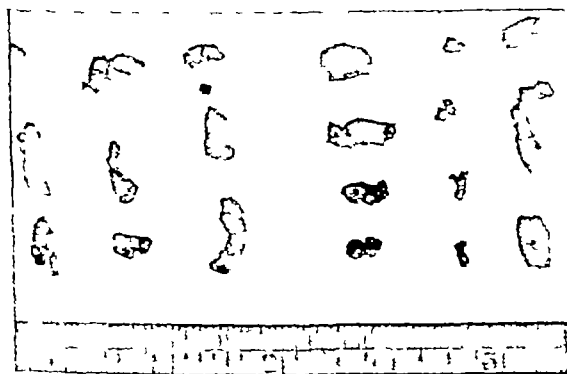
Any method that will produce results is worthy of a just trial.

During the past eight months I have used it in malignancy, scar contraction following previous prostatectomy, simple fibrosis and in cases of complete retention due to hypertrophied middle and lateral lobes with gratifying results.

EQUIPMENT USED

I have used the McCarthy "Resectoscope" with the bakelite sheath and three different makes of spark-gap machines. I have had no experience with the so-called "tube" type of cutting machine. At first the cutting loops supplied were very fragile and did not cut so well. They were poorly insulated and apparently could not stand up under the powerful cutting current. A heavier wire and much better type of insulation is now being supplied and it has been my experience that the new loops stand up under pressure and are far superior in cutting qualities to those first supplied.

These new loops have made it possible to cut larger bites and it has been observed by me that



These are photographs of several pieces of prostatic tissue removed with the McCarthy Resectoscope. With the inch scale you can visualize the size of the pieces of tissue.

there is less searing of the cut surfaces which I think is an important factor in the post-operative convalescence.

I will now show a slide demonstrating that the surface coagulation amounts to less than 1 mm. in thickness.

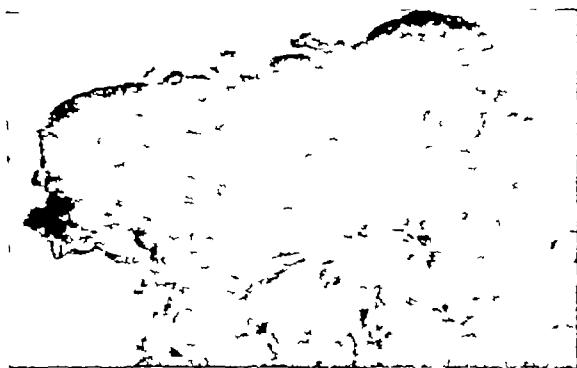
PRELIMINARY TREATMENT

These cases should be hospitalized and awarded the same preliminary treatment as for prostatectomy. The bladder should be gradually decompressed and careful recognition of the blood chemistry, blood counts and clotting time, etc., should be made. Fluids should be forced and careful note made of the intake and out-

put. Every effort should be made by bladder lavage and the use of urinary antiseptics to render the bladder and urine as clean as possible. I have not done any vasectomies in this series.

As regards preliminary cystostomy this should be done when indicated, especially in badly infected bladders and those with uremic symptoms.

In this series five cases had suprapubic cyst-



Lantern Slide X 250*

Photomicrograph of section of a piece of resected prostatic tissue. At the base of the slide is a small amount of relatively normal connective tissue with well stained nuclei—above this is a wide zone of coagulation in which no cell outlines or nuclei are visible and above this a narrow zone of charring. There is less than 1 mm. of destruction due to the cutting current about the edges of the tissue.

tomies done, due to the above specified conditions.

I have used a large Pezzer catheter suprapubically and find that if the catheter is pulled taut and a Kelly clamp applied close to the abdominal wall that the bladder is held nearly water-tight during the resection.

Here I want to issue a warning that may prevent serious trouble and that is the careful watching for overdistention of the bladder whilst operating. It has been my experience that due to clots perfect backflow through the sheath may be impeded and before you realize it you have the bladder distended well above the symphysis. One should have an assistant watch this in order to prevent extravasation and also rupture of the bladder or of a diverticulum, an instance of which has been reported by one author.

TECHNIQUE

Regarding the actual technique I have followed that described so amply by McCarthy. I have found in the employment of the spark-gap machine that in the excursion of the cutting loop I observed less bleeding and cleaner cutting, if it occupied from seven to nine seconds.

In those cases where suprapubic cystostomy has not been employed I have, when possible, explored the bladder with the simple observation cystoscope so that I would have a perfect picture of the bladder and its outlet and also ascertain whether calculi, diverticuli and neo-

*Editor's Note This illustration has been slightly reduced.

tion of symptoms in so difficult a group Transurethral resection is still a new method Its true value will be determined only when the elapse of time has defined more accurately its faults and its virtues At present it seems destined with little doubt, in properly selected cases, to hold an important place in our therapeutic program

OBSERVATIONS IN TRANSURETHRAL PROSTATIC RESECTIONS*

BY EDWARD J O'BRIEN, M D †

THE purpose of a symposium on prostatic resection I believe is to discuss the advantages, and I hope disadvantages too, of this particular method

To properly evaluate this procedure we should view the problem with unbiased minds and also remember that old saying—"No one is so bad but in whom some good a loving eye can see"

Some are apt to throw cold water on anything that does not carry their own label so I feel that we should look upon resection with open minds and after weighing all the evidence, then evaluate this surgical procedure

It is now over one hundred years since Guthrie established as a clinical entity obstruction at the vesical neck as distinguished from hypertrophy of the lobes of the prostate

Since that time the recital of the history of this particular portion of the urinary tract is really the history of various instruments devised by a score of men designed to give relief to those suffering from urinary retention

Up to 1920 when Caulk, using the Young sheath, brought out his cautery-punch, one device after another was tried and found wanting

Stimulated by Caulk, other men brought forth the products of their brains and ingenuity and due principally to Stern and McCarthy, we have the wonderful instruments of precision which we are using today for prostatic resection, so aptly spoken of as the burning question of the hour in urology

The operation has gained wide popularity with urologists all over the country with the possible exception of conservative New England

Some of the older surgeons have been "thumbs down" on the method whilst some of us younger ones have with timidity and temerity, feeling that men like Davis, McCarthy, Braasch, Bumpus, Collings, Kirwin, cannot all be wrong have decided to see for ourselves what value this method possesses

I happen to be one of those who has ventured forward and tonight offer the observations and results in a small series of eighteen cases of transurethral prostatic resection

The first four cases which we resected brought

forth such spectacular immediate results that, because of enthusiasm so aroused, we felt that this was a simple procedure and somewhat of a panacea.

However, we were soon disillusioned and then realized that the procedure was not so simple and was attended with much danger Those who first brought forth this method of treating the obstructing prostate were quite emphatic in stating that resection was a minor surgical procedure and could be used in all types of obstruction Some have, in recent communications, modified these claims

We want to go on record now by stating most emphatically that transurethral prostatic resection is a procedure that is anything but simple It is by no means a minor operation but on the other hand a very technical procedure, requiring a vast amount of patience and skill and is also loaded with much dynamite It should be done only by those who are thoroughly familiar not only with cystoscopy but endoscopy and not by the occasional cystoscopist

Furthermore, I agree most heartily with Alcock when he states—"the only way to learn this method is by actually doing it I know of no way you can teach another man to do this particular thing"

Whilst our series is a small one the results have been surprisingly good and therefore we are rather enthusiastic over the procedure and feel that it has its place in the treatment of prostatic obstruction and is here to stay

For certain types of obstructions the superiority of resection is undisputed, especially the sclerotic, as well as for median lobe hypertrophies which are not too large

However, in the true large intravesical hypertrophies it must be confessed that resection is in the experimental stage

There is apt to be much controversy and a wide diversity of opinion as to the value and proper extent of this method and I feel that time and the judicious use of the method will determine its proper place in the battle against prostatic obstruction

It is true that this procedure is diametrically opposed to surgical concepts of those who have elevated the surgery of the prostate gland to the high standard it now enjoys They have decreed that in order to effect a cure that all of the obstructing gland must be removed However the operation of transurethral removal of

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tion Thirteen I considered had excellent results three were fair and two were poor In this series three had complete retention of from 8 to 36 ounces an average of 14 ounces Thirteen had preliminary catheter drainage and five had suprapubic cystotomies previous to resection The average postoperative hospital stay was twelve days

Two of these cases were obstructions of the median bar type, one was a carcinoma and one a case of scar tissue formation following a previous suprapubic prostatectomy Six were classed as median lobes and eight as bilateral and median lobe enlargement The results in the case of carcinoma and that of scar tissue formation following suprapubic operation were excellent as were the two cases of median bars

I feel that I should acquaint you with the facts in the two fatal cases at this point

CASE No 18710 Choate Memorial Hospital H. B. aged 79 His chief complaints were pain difficulty, occasional dribbling and nocturia He had 9½ ounces residual of urine that was not badly infected He was on drainage five days His N P N was 25.5 mgms had a normal output and general condition considered good for a man of his age He had an enlarged middle lobe with slightly enlarged lateral lobes On May 10 1933 I resected 5.8 grams of prostatic tissue and had no trouble with bleeding Twenty-four hours later his temperature rose to 103° F and he began to vomit. Using intravenous glucose hypodermoclysis and digitalis he responded to treatment and appeared to be doing well when on the evening of the fourth day he suddenly died

The other death occurred thirty-five days following resection at home of cardiac failure and uremia While I do not believe resection was the direct cause of this death I believe that no symposium will serve its purpose unless we state facts as they are

CASE No 17820 July 5 1932 P W aged 70 Had chronic cardiac disease for thirty-five years For eighteen months past has had much dysuria frequency and difficulty Had a large smooth prostate mostly median lobe hypertrophy Catheter drainage was instituted but the patient did not show enough improvement so on July 22nd a suprapubic cystotomy was performed His improvement was such that on August 5th resection was done He had a rather severe postoperative reaction but rallied and on August 15th his condition was considered good. Twenty-five days following resection he left the hospital and died ten days later at home I feel that this is a case where I should have sent him home at first with a permanent suprapubic tube and never made any attempt to submit him to surgery

In this series two cases had to submit to a second resection while one case was resected four times before he had no residual This case is worthy of being brought to your attention

CASE No 34159 Cambridge City Hospital A. W. aged 69 Had frequency and difficulty and hypertrophy of both lateral and median lobes In August, 1932 he had 36 ounces residual of foul smelling urine and after two weeks preliminary drainage I resected him and he left the hospital twelve days later still having 18 ounces residual He was resected again on December 2nd and after six days

left the hospital with 12 ounces residual He returned a month later and still had 12 ounces residual He complained that he could urinate perfectly whilst sitting down but had difficulty when standing I did a third resection and he left the hospital in seven days with eight ounces residual He returned again in April 1933 and after removing five grams more of prostatic tissue he left the hospital in eight days able to completely empty his bladder

This is a good example of a case that I do not believe would have stood prostatectomy but by easy stages was relieved with a total of thirty-three postoperative hospital days

CASE No C-2386 St. Elizabeth's Hospital H. D. aged 71 clerk. He entered the hospital on July 19 1932 Had been catheterized for several days before entering the hospital and finally had acute retention. On July 28th, after eight days of catheter drainage he was resected and five days later when the catheter was removed he could not void On August 9th a second resection was done On August 13th the catheter was removed and the patient voided having four ounces residual He was discharged on August 16th nineteen days following first resection On October 1st he had a clear urine and no residual

The other case which I had to resect twice was done at the Brooks Hospital He was a painter, aged 63 whose story reads about the same as the above-noted case This man is now very well and has no residual urine

To show what may be done in very poor risks I will give you an abstract of a case of a very large intravesical hypertrophy which would never have stood open operation

CASE No 5093 Forest Hills Hospital J. H. aged 74 laborer For four years he had all the symptoms of obstruction with intermittent acute retention On August 17 1932 he was brought to the hospital with bladder distended up to the umbilicus Blood Pressure was 180/102 N.P.N 60 mgms per 100 cc. of blood His heart was decompensated and the bases of both lungs were filled with fluid I felt that surgery had nothing to offer him He was kept on permanent catheter drainage for one month at the end of which time the N.P.N was 36 mgms per 100 cc of blood The cardiorespiratory condition had improved I did a resection under spinal anesthesia and he left the hospital on the eleventh day following the operation He has enjoyed good health since and has a urine that is quite clear I cannot report as to whether he has any residual for he has persistently refused instrumentation of any sort feeling that if he submits to catheterization something might be started

I believe that too much stress has been laid on short hospital stay It is true that these patients are able to go home after a short hospital stay but they are in need of surgical attention and as half of my cases have been private cases this may explain a longer hospitalization than some writers report

CONCLUSION

Prostatic resection is a step forward in treating obstructions of the vesical neck but not a panacea

plasms complicated the bladder neck obstruction

After exploring with the foroblique telescope and having made a decision as to just what sort of a problem was at hand I planned my attack and set to work. With cutting loop extended as far as it will go I attempt to visualize the actual excursion of the loop and the tissue it will engage by manipulating the loop handle before applying the cutting current. I then contact the cutting loop to the vesical aspect of the obstruction, holding the instrument in the left hand and with the right hand manipulate the arm controlling the excursion of the cutting loop. After each excursion the telescope and cutting loop are removed from the sheath and usually the cut tissue will come out with it.

The sectioned piece, if it does not come out with the sheath, may be expelled in the irrigation. Very often it does not come away, especially if the cutting is very clean and then I find that in most instances you can fish it out of the bladder with the loop.

BLEEDING

When cutting, it is rather imperative to see that the continuous irrigation is free and that the outlet is wide open, if not you are apt to burn out the bakelite sheath as was my experience in one case where my assistant did not open the outlet flow when the cutting current was working.

In the search for bleeding points I find that the outlet should be closed. If the irrigating fluid is allowed to run in with the outlet closed the bleeding points will appear as if smoke were coming from a chimney and thus recognized may be easily coagulated.

After you have decided that sufficient tissue has been removed you then, through the sheath, insert a 22 to 24 F double eye soft rubber catheter and arrange it so that it will insure continuous drainage. The irrigation now should be clear enough to assure one that he is dealing with only a slight ooze and not a real hemorrhage. Some operators have stated that drainage must be absolutely clear at this time. I must confess that in only two cases have I felt that the drainage was absolutely clear when I finished operating.

The amount of tissue to be removed has been the big problem with me. One case which I will bring to your attention caused me much concern inasmuch as I had to resect his prostate four times before acquiring a good result. He had a large intravesical type of prostate with thirty-six ounces residual. I finally discharged him with no residual and a clear urine. It happened in this case that I removed the median lobe and then the lateral lobes folded over into the vesical outlet and as a consequence the obstruction was only partially relieved.

ANESTHESIA

Most operators have used caudal, sacral and parasacral anesthesia but I have employed spinal exclusively. I used at first 150 or 100 mgs of novocain crystals because it took me from one hour to one hour and forty-five minutes to complete the operation.

In my recent cases I have used 75 to 100 mgs of novocain crystals inasmuch as I have found that this amount has afforded me sufficient anesthesia to complete the procedure. It now takes me about one hour to complete a resection in cases where there is not much bleeding.

POSTOPERATIVE CARE

Careful and constant intelligent care of the retention catheter is the most important item of aftercare. It should be irrigated every hour during the first twenty-four hours following operation, for it is most important to keep the catheter from being blocked so that it will drain constantly. If this is done the patients are very comfortable. Urinary antiseptics are given and fluids forced and regular diet is given on the day following resection.

The catheter is withdrawn when the urine is free from macroscopic blood and the temperature is down to normal. I have kept the catheter in from three to ten days, the average being three to four days. I have made it a practice to fill the bladder with warm boric solution before withdrawing the catheter and then attempt to have the patient void.

One of my cases was unable to void at all and I had to put him on drainage again for a week and then do a second resection. Another had only a small stream and being unable to empty his bladder I had to resect him a second time.

COMPLICATIONS

The complications encountered were hemorrhage, fever, epididymitis, uremia, local infections of prostate and embolism. All of the cases showed some slight amount of postoperative oozing but this usually cleared up in two or three days.

In only one case was I concerned about hemorrhage and this bleeding was controlled by irrigation and ceased in twenty-four hours.

Five cases had epididymitis, an average of twenty-seven per cent. One case appeared six weeks following operation and all responded readily to local treatment without surgery.

Only one of the cases showed surgical shock but all ran fevers ranging from 99.2° F to 103° F. The elevation in temperature usually subsided in a few days.

In the past nine months eighteen patients were resected. One patient who was 79 years of age with a large median lobe died on the fourth day very suddenly of embolism and another with hypertrophy of the middle and bilateral lobes died at home thirty-five days after resec-

perineal abscess, and the operative failure, all occurred in patients with large benign glands. One additional patient in this group of seven has persisting bothersome urinary symptoms although there is no residual urine. Only three have entirely satisfactory end results.

One secondary hemorrhage, and two severe temperature reactions occurred in patients with small fibrous glands. The twelve done, however, are living and have satisfactory end results.

One patient with a bar and a carcinoma of the bladder both of which were treated by the

tous tissue. Unless restoration does occur poor functional results are to be expected.

CONCLUSIONS

- 1. Transurethral prostatectomy is a highly technical procedure which carries a very appreciable risk of morbidity and mortality.
- 2. Its great dangers seem to be due to technical errors, hemorrhage, and sepsis.
- 3. Good results may be expected from its use in cases with median bars, carcinoma of the prostate, and small fibrous prostates.

TABLE 1

Type of Gland	No. of Cases	Comp. Reten.	Large Resid. 6 or +	Loss than 6 oz. Res.	Severe Temp. 101-105°	Mod. Temp. 102-103°	Mild Temp. 100-101°	Slight Temp. 99-100°	Non Primary	Hem. Sec.	No Res.	Good Results	Deaths
Grade III benign hypertrophy	7	2	2	3	2	3	2			2	4	4	2
Small fibrous glands	12	4	1	9	2	5	4	1		1	12	11	0
Bars and contractures	14	3	3	8	0	4	10			0	14	14	0
Carcinomas	7	5	1	1			4	1		0	7	7	0
Total	40	14	7	21	4	12	20	2		3	37	36	2

resectoscope has partial urinary incontinence when standing. No other complications have been encountered in the patients with bars and carcinomas of the prostate.

COMMENT

We shall follow our patients long enough to determine the ultimate end results as sufficient time has not elapsed to judge finally as to recurrences. At present we are entirely satisfied with the outcome of the operation in patients with bars, carcinoma of the prostate, and small fibrous glands. The large benign glands have discouraged us sufficiently to cause us to discontinue its use in this type of case.

Judging from the amount of tissue obtained in the average case, probably the removal of about one sixth to one fifth of the total gland is sufficient to relieve obstruction as a canalization is all that is sought. Consequently the larger the gland the greater is the amount of tissue left in situ. As this tissue is always infected or becomes infected following operation, a good culture medium and ideal conditions are supplied the infesting bacteria by the serum and devitalized tissues sealed in the glandular ducts by coagulation and edema. These facts seem to offer the logical explanation for the severer complications in the larger glands. It seems improbable also even though patients of this class did successfully withstand the operation that good results can be expected. The prostatic urethra when greatly distorted can never be restored to a normal contour by any operation that does not remove the entire adenoma-

- 4. It does not seem to be a suitable operation for large adenomatous glands.
- 5. Many patients with bars, carcinomas, and small fibrous glands who are too poor surgical risks for open operations successfully undergo this operation.
- 6. While transurethral prostatic resection has a good wide field of usefulness it can never replace the enucleating type of operations.

DISCUSSION

DR. ARTHUR L. CHUTE: I have been greatly interested in some of the things that have come up tonight. I remember nearly 40 years ago when I was a house officer that they were talking of doing and worse yet were doing double castration for prostatic obstruction in a proportion of cases. Then came Bottini's operation and we have had outbreaks of modifications every so often since. It seems to me that a mortality of 20 per cent is outrageous unless we are doing experimental surgery and I think it is all due to the same old trouble: sepsis and inadequate drainage.

I have been much surprised that anyone should bring up the question of previous drainage. That is what this operation was supposed to avoid—that is to be able to go ahead and get the prostate out without that. It seems to me that this is very interesting but that it hardly meets any of the problems. You speak of the inability to do these big prostates on most men. Of course we can do them. However it means time and you cannot go ahead without careful preparation. While I am very much interested I think this should be studied more critically for there is certainly something in it, but at the present time it is really a disappointment to me to see its apparent small scope. The percentage of cures is not justified by the mortality and I believe we want to be very careful about the way we use it.

It is indicated in prostatic obstruction of the median bar type and in obstructing carcinoma

It is a difficult technical procedure attended with many possible serious complications

It must be decided what is the comparative risk of the method to the patient, in comparison with the methods now employed and which have been tested for many years

It has its place but time alone and the proper

use of the operation will, over a long period of time, render us its true relative value

There is no doubt but what the mortality rate and results will improve with experience and acquired skill. This is aptly proved by Alcock, who in his first 50 cases had a mortality rate of 24 per cent, 6 per cent in his second fifty and only 4 per cent in his third fifty cases. His mortality was only 4 per cent in his last 100 cases out of a total of 175 to date

PROSTATIC RESECTION AT THE LAHEY CLINIC*

BY JAMES B. HICKS, M.D.†

DURING the last year the subject of transurethral prostatectomy has undoubtedly received more attention than any other in urology. Highly satisfactory results from its use have been reported by some and quite unsatisfactory ones from others. Somewhere between these two extremes we believe is the true position of this procedure.

Those urologists who have had a very extensive experience with the operation, by observation of their cases have been able to evolve for themselves, its true value, its limitations, its technical difficulties, and its risks of morbidity, and mortality. Although our number of cases is not large, we think an analysis of them strongly supports certain conclusions.

That the method has a wide field of usefulness but is not suited to all cases of obstructing lesions of the prostate, the majority of urologists are convinced. Therefore, the real problem seems to be in determining which types of cases should be treated by it and which should not.

Its greatest dangers seem to be due to technical errors in operating, hemorrhage, and sepsis. While all three of these principal complications can be decreased greatly by experience of the operator they will always remain as ever-threatening and require the best surgical skill and judgment for their proper control. Consequently, the procedure cannot be regarded as one of a minor nature, but it should be treated with just as great respect and caution as any operation of major importance.

In this discussion we shall speak of three principal types of prostatic disease causing urinary obstruction, benign prostatic hypertrophy, carcinoma of the prostate, and median bars or bladder neck contractures. The term small fibrous prostate is employed to designate that type of benign obstructing prostate in which there is a marked grade of fibrosis, probably from chronic inflammation. These glands when enucleated weigh from fifteen to thirty-five grams.

Our patients are carefully studied by history, physical examination, residual urine tests, cystourethroscopic examination, and renal function determinations. They are prepared for operation by constant urinary drainage, large fluid intakes, urinary antiseptics, bladder irrigations, and laxatives. These measures are continued until there is an indication that there is a maximum of improvement from them.

Postoperatively constant urinary drainage is maintained by the use of an indwelling urethral catheter from one to two days until the urine is clear of blood for at least twenty-four hours. Boric solution irrigations are used often enough to keep the catheter draining freely. At the time when the catheter is removed the bladder is filled with boric solution, the patient observed as to his ability to micturate and as to whether any bleeding occurs. When bleeding is noted, the catheter is immediately replaced.

All patients are tested for residual urine before leaving the hospital, at intervals of one month, three months, six months, and twelve months when possible. Practically all cases have reported regularly and those who have not been seen personally have reported by mail.

Sacral and field block anesthesia is used in operating. The vasa are ligated as a routine. All of the recovered tissue is weighed and examined pathologically. From three to eight grams have been obtained as a rule with a maximum of twenty-four. The McCarthy resectoscope, energized by the complex oscillator machine, has been used in all cases.

Forty patients with prostatic obstruction have been subjected to this method of treatment. Five of these patients were exceedingly poor surgical risks and it is very doubtful if any of them would have survived an open operative procedure. None of these five died from prostatic resection however (Table 1).

The list of our complications is as follows

1	Deaths	2
2	Secondary hemorrhage	3
3	Periurethral abscess	1
4	Operative failure	1
5	Partial incontinence when standing	1
6	Ruptured bladder	1

Both deaths, two secondary hemorrhages, the

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In the places where open prostatectomy is no longer being done, I do not believe the patients are receiving the best treatment and I commend our speakers tonight for their conservative attitude and for the straight thinking they have given us along this line when they say this treatment should not be used in all cases. It certainly should not as it is absolutely impossible to treat properly these very large adenomatous prostates by any such method. From what Dr Crabtree said a few moments ago, it will be seen that we are rapidly getting back to the earlier open surgical method of treatment. The time of preparation has been lengthened, and all methods of procedure seem to have been lengthened so that the very thing for which this operation was originally intended is changed. It was originally believed that this procedure would in convenience the patient just a day or two. That was one of the first reasons offered for its use and yet we are finding this a real surgical procedure and that real preparation is essential.

In regard to the transurethral method in a recent statement in the Mayo Clinic Bulletin Bumpus stated that he has resorted to the cold knife because in his opinion a cut with the knife heals quicker than a wound that is cooked with the electrical apparatus and also that it lessens sepsis. I also feel that we have been shown here tonight that the great danger is sepsis.

DR. J D BARNEY I can add but little in the few moments at my disposal. I perhaps indicated that I had been as conservative as I could be. I started out being so and my experience made me more so. I have done only six private cases; the rest have been hospital cases. I think there is something to be said on the subject from the fact that the average hospital case in every public ward has not the powers of resistance of the private case, because in the Baker Memorial out of 24 cases only one died whereas in the general hospital there was quite a different type of man and nine died. Of the six private cases there were no deaths. I agree that this prostatic resection has a field of usefulness but I think the field is limited. We have to be extremely careful how we select our cases and very meticulous in the technique from every possible point of view. The more we go on with it, the more we realize that prostatectomy perineal or suprapubic, is in the majority of cases the operation of choice.

DR. FLETCHER H. COLBY I am sure we have all enjoyed the very honest exposition on prostatic resection. I would only like to add one thing to it. The death at the Baker Memorial was a case of mine. This was a man in excellent condition about 65 years old with early cancer of the prostate. He had an uninfected urine low n p n and a very good phthalein excretion. He was possibly a good candidate for total prostatectomy. However, he refused the more serious operation. This resection was explained to him and he chose that. His prostate was resected and at the same time about 600 mc. of radium were put into his prostate through the perineum in gold seeds. He developed bronchopneumonia about a week after the resection and died. He was autopsied; his bladder around the region of his prostate was gangrenous and sloughing. There is no question but that that was the focus of his bronchopneumonia and bronchopneumonia was caused by the prostatic resection. Whether the added trauma to the prostate by radium application had anything to do with this I am sure I do not know. I feel it is possible that it did. However, in all fairness to statistics such cases of bronchopneumonia and pulmonary embolus which are results of sepsis should be included as deaths from the resection itself.

DR. C N PETERS We have done 25 cases of prostatic resection at the Maine General Hospital, Portland and I can report 20 of them favorably. Three cases died, one of rupture of the bladder which was recognized immediately but the patient died of surgical shock. Two died from sepsis. Two cases had suprapubic operations afterwards. On one of these, the suprapubic operation was done immediately for terrific hemorrhage at the time of resection. The gland was removed and the patient recovered. The other suprapubic operation was done about 15 days after resection. It was on a carcinomatous prostate and an unsatisfactory surgical result had been obtained from the resection, but the patient did not want to be resected again so I opened his bladder and removed a portion of the gland. The failure in that case was caused by too little removal of tissue.

I feel regarding resection that the mechanics of the procedure are very nearly perfect in a selected type of case and I feel that sepsis is caused by failure of our electrical current making a large area of devitalized tissue.

We have hospitalized our cases a great deal longer than most cases reports of which we have been able to get from men who have advocated this procedure except Alcock. I think three weeks has been the average. We have had no cases in which we did not get infected urine and invariably the cases show temperature reaction after resection. I am conservative but I feel that the procedure certainly is a step in advance in urological surgery.

DR. CHARLES J E KICKHAM In the midst of these alternating expressions of pessimism and optimism on the question of prostatic resection I am prompted to discuss an interesting case which was recently encountered at the Pondville State Cancer Hospital.

The patient, a man of seventy years, was admitted to the Hospital with complete urinary retention. He was immediately placed with gradual decompression on constant catheter drainage. A diagnosis was made of carcinoma of the prostate advanced, with metastases to the spine and pelvis. His history disclosed the fact that he had been previously treated for cerebrospinal lues. His pupillary and patellar reflexes were inactive and his Romberg test positive. However, the blood and spinal fluid Wassermann were negative. It was felt then in view of the advanced stage of the prostatic disease and the evidence of metastatic malignancy to his spine and bony pelvis that no treatment was indicated other than deep x ray therapy and medical care. After he had been on catheter drainage for many weeks without improvement and in spite of antiluetic treatment, it was felt advisable to help him in some way. He was a man in fairly good health and was buoyed up with great hopes due to the fact that the patient in the adjoining bed had previously been resected with excellent results. He requested us to operate on him and free him from the cares of catheter life. After the patient had been made cognizant of the possibilities of failure we with some misgivings as to the efficacy of the procedure in this particular case did a resection on April 6th. Ten days after operation the catheter was removed but the patient still had complete retention. However, on a régime of intermittent catheterization and irrigations of the bladder his residual urine diminished from 20 ounces to eight ounces which it is at the present time and it is felt that under this treatment it will be even further diminished.

This is really a very interesting case showing the presence simultaneously of a neurological disturbance and a mechanical prostatic obstruction. The result in this case proved the resection justifiable.

Another experience with an early case at the Carney Hospital is worthy of comment. The patient

DR. E GRANVILLE CRABTREE As most people know, I have stood on the conservative side of this question. My reason for this position is that I feel that greater than justified expectations from this operation have been promised to the medical profession and the laity, in such a way that every hospital has been converted into an experiment station and every urologist and some others into experimenting surgeons.

I have felt all along that a certain amount of misrepresentation has been responsible for this unfortunate situation. It would have been possible for some of the facts which are now appearing to have been worked out by the sponsors of this operation before the project was launched with the wide publicity which it received.

We have performed prostatic resection in but a few cases at the Beth Israel Clinic. I, personally, have done four. One of these was a fibrous bar and gave excellent results. I did the case which Dr. Brodny has reported as a mortality in a diabetic with death due to septicemia. One cancer case gave an excellent result. In a recent case it was interesting to note that when the cold punch was used to remove the tissue and hemorrhage controlled by the employment of an intraurethral bag of home design, with all coagulation eliminated, the patient made a short convalescence and was free from any fever whatever. This was an attempt to go Bumpus one better by the total elimination of cautery. There has been sepsis in these four resection cases very similar to the picture presented in Dr. Hicks' report. I agree with Dr. Chute that I do not like sepsis. I came into urology when there was considerably more sepsis in our cases than there is today. I helped to work toward its elimination. This transurethral procedure is a return toward sepsis which I dislike very much indeed and which I will do a great deal to avoid.

I have been interested to note that many practitioners of resection, some of whom were among those who formerly recognized no limitations to the procedure, are now hedging. One is now advocating two weeks preliminary dilatation of the urethra preparatory to the passage of the large resection instrument. Mathe also advises such preliminary preparation of the urethra because of the occurrence of extensive and permanent damage either from the dilatation or from leakage of the current. Many are advocating prolonged stays in the hospital up to two weeks or more after resection. A few still prefer that the patients have their complications at home out of the hospital records. All have come to realize that sufficient preparation to fit the individual case must be given before this operation or any other is employed. Bumpus advocates introducing no sepsis by avoiding constant drainage in those cases without residuals or with small uninfected residuals.

Recently, Caulk has attempted to determine what becomes of the high power current which many, with little knowledge of electricity, are blithely introducing into patients. His publication, when it appears, will be read with great interest.

By the use of thermocouples at a distance of $11\frac{1}{2}$ centimeters from the point of application of the current, he notes that a single resection cut will raise the temperature at that remote distance to a point near to devitalizing of tissue while three cuts of the same length in the same area raise the temperature well above the devitalizing point yet the slough which attends devitalizing may appear weeks later rather than at the time of operation.

Let me mention a few more facts regarding the Beth Israel Hospital cases.

Altogether ten resections have been done. There have been temperatures ranging from 100° to 105°

with chills in all cases except four. One died of septicemia after such resection. There has been one severe urethritis, the urethrogram from which patient I will now show you. We have had two cases in which re-operation was necessary. The first case had a duodenal ulcer and was a patient in poor condition but with an uninfected two ounce residual. He had been in and out of the hospital repeatedly because of symptoms. Resection seemed eminently fitted for his problem and was done. Within two months he returned with a decomposed bladder foully infected. He is now in process of undergoing prostatectomy. An interesting finding in his prostatic region is that following the cautery there appeared a ring of whitened tissue $\frac{1}{2}$ centimeter beyond the internal orifice. We felt that the current used may have been more powerful than we would now employ. The specimen removed at prostatectomy showed this white area to be a true leukoplakia.

The other case was interesting in that a suprapubic cystotomy was necessary because of the condition of the patient. When, after a long period of preparation, operation was advisable, a great deal of tissue was resected on two occasions and a very satisfactory appearing channel through the gland, produced. His suprapubic sinus remained open. His bladder residual ranging from 15 to 18 ounces for a period of six months, at which time 20 grams of prostatic tissue was enucleated. Inelasticity of the prostatic bed was the pronounced finding noted at operation. He healed within two and a half weeks after operation. He now has no residual and his urine is clear of infection.

DR. E. L. MERRITT Some one has said that we were given two ears and only one mouth in order that we may hear twice as much as we say, and I had intended to come here tonight simply to listen but I cannot refrain from saying something on this subject. Those of you who arise very early in the morning and who sit up late at night may, from time to time, have listened in to a radio broadcasting station in the southwest part of our country where they talk on certain types of treatment for prostatic hypertrophy and I think the American Medical Association and organized Medicine have deprecated the cheap advertising that has been done in this work. Yet since this transurethral method of approach for hypertrophy of the prostate has appeared, I think that in urology all we need is the radio broadcasting to put it on the same cheap basis and I am very sorry to see our field of medicine so cheapened. I do not know whether in Boston you have salesmen for various surgical supply houses who come into your office and act tremendously surprised to find you are still doing the open operation of prostatectomy and inform you you are twenty miles behind the parade but in the small towns that is what happens. I have had a number of them walk into my office and bluntly inform me that I am not up with the procession because I still do prostatectomies and also I have had them offer to come down to the hospital and show me how to do the new transurethral operation. I do not want any one to feel that I am so old fashioned that I do not want to try anything new. I have been using the so-called cold punch for some five to six years in certain selected cases and I still do so but I am absolutely opposed to the kind of talk and cheap propaganda that has gone on in the last year or two in regard to transurethral prostatectomy.

Those of you who went to Toronto last year will remember that very wonderful paper by Dr. Alcock. It will go down in urological history as one of the finest presentations made on the subject because it was so honest and straightforward. You will recall that the crowd rose and cheered when he finished

- a A history presumptive of gonorrhea
- b Clinical evidence presumptive of gonorrhea
- c Exposure to a known case of gonorrhea
- d Infection of another person with gonorrhea (her sexual partner, a female child, her infant's eyes, etc.)

3 Intracellular gram-negative diplococci which resemble the gonococcus, in smears from the genito-urinary tract of a female child, warrant the diagnosis of gonorrhea only when supported by one or more of the following

- a Gonorrhea in the child's immediate family, personal attendants or associates
- b Evidence of sexual relationship in some form
- c Cultural proof that the organism is the gonococcus

THE EXTRACELLULAR GRAM-NEGATIVE DIPLOCOCCUS

In the very earliest hours of acute gonorrhea and in chronic gonorrhea the gonococcus may be predominantly extracellular (outside the pus cells). If, after painstaking search of several smears, no intracellular organisms can be found, any one of several procedures may be followed

1 If the extracellular organisms are found in typical clusters and the history or clinical findings are presumptive of gonorrhea, a clinical diagnosis of gonorrhea may be made and the case treated as such. Smears should be examined at frequent intervals thereafter as intracellular organisms may be found at a later date

2 If the patient has consulted any other physician, inquiry should be made of that physician as to whether he has any record of organisms resembling the gonococcus having been found

3 If possible, especially in women and children and certainly in medico-legal cases, cultural study should be made

THE "NEGATIVE" SMEAR

Too many physicians are satisfied with a single laboratory report that no "organisms resembling the gonococcus" can be found. Even in acute gonorrhea (frequently, in the female) the first one or two smears may be negative for typical organisms. *Smears should be examined at regular intervals so long as the patient presents an undiagnosed infection of the genito-urinary tract*

There are several reasons for "negative" smears, some avoidable and others unavoidable

1 Failure to take smears from the proper locations or with proper care. In the male, smears should be taken from the discharging urethral meatus, from any discharging sinus, and *when it is safe to do so*, from the prostate by means of massage

In the adult female smears should be taken

from the urethral meatus after thorough evacuation of Skene's glands by firmly massaging the floor of the urethra against the under surface of the pubic arch. If the vulvo-vaginal (Bartholin) glands appear to be involved, they may be massaged and smears taken from their openings. The cervix should be thoroughly cleansed of accumulated discharge and the smear taken from the cervical os or canal. It may help to squeeze the cervix moderately between the blades of the speculum. Vaginal smears are of little or no consequence in the adult female, since the vagina is the least involved of all the structures

In the female child, smears should be made from the mucous membranes of the vulva or from just within the vaginal orifice if that can be done without hurting the patient. Smears from a virgin child's cervix need be taken only in very exceptional cases, as for example certain medico-legal cases which require exhaustive study

2 Negative smears are frequently obtained if taken too soon after the patient has voided or has had a treatment. Urination, douching or irrigation may remove the organisms from the surfaces

3 Frequently "positive" smears may be obtained in the female only just before menstruation begins or just after it is completed

4 Chronic gonorrhea in either male or female is an involvement of tissues below the surface. If the disease is relatively quiescent clinically, undigested or recognizable organisms may seldom reach the surface except under the stimulation of intercourse or any sexual excitement, alcohol or provocative treatment. Innumerable smears from such cases may be negative for the gonococcus. It is always difficult to find the organisms in the prostatic secretion. The female pelvis may be acutely involved without any organisms being found in smears from the cervix. In such cases repeated examination of smears, sometimes after artificial stimulation of discharge is essential. Ultimately the diagnosis may have to be made clinically without the more specific laboratory aid in confirmation

OTHER LABORATORY PROCEDURES

Pus Cells In Smears

Every laboratory which examines smears for the physician who treats gonorrhea should report the approximate number of pus cells found per oil immersion field. Anything more than the normal number of cells should excite suspicion, and persistent attempts should be made to determine the reason for their presence. Even non-gonorrheal urethritis or prostatitis, non-gonorrheal cervicitis or vulvo-vaginitis deserve medical attention. It is not good medical practice to dismiss the patient simply because it cannot be proved at once or ever that he or she has gonorrhea. The patient, the sexual part-

received the usual preparation for resection, and caudal anesthesia was given. When we attempted to pass the sheath into the bladder we were unable to do so. This was not due to any obstruction, but to the fact that the urethra was so elongated that the bakelite sheath would not enter the bladder.

It may be added that as a preoperative and post operative treatment of alkaluria and alkaline infections in these cases, irrigations of the bladder with 1 per cent or 2 per cent acetic or phosphoric acids have been quite effective in our experience.

DR SAMUEL N VOSE. Our results with transurethral methods at the Massachusetts Memorial Hospitals are based on a series of some 60 odd cases covering a

period of about three years. They are comparable, I believe, to those of other beginners. Some have been excellent, others have been unsatisfactory. It seems only fair, however, to bear in mind a distinction between results of resection and the results of unsuccessful attempts at resection. Our results, in general, lead to a belief that to a large extent the failures have been due to faults of technique or errors in selection directly consequent upon inexperience. It seems hardly fair for me to blame the method for my unfamiliarity with it. At present, I believe that perhaps the majority of obstructions are best treated by prostatectomy. Whether wider experience will result in a more general application of resection remains for the future to determine.

THE NEISSERIAN MEDICAL SOCIETY OF MASSACHUSETTS

THE MANAGEMENT OF GONORRHEA*

I The Laboratory In The Diagnosis of Gonorrhea

LABORATORY procedures have an important place in the diagnosis of gonorrhea. They also have certain unfortunate limitations. The physician who attempts to diagnose gonorrhea and to manage it properly must have a full understanding of these limitations.

"ORGANISMS RESEMBLING THE GONOCOCCUS"

The laboratory procedure most commonly used in the diagnosis of gonorrhea is the search for "organisms resembling the gonococcus" in smears from the affected parts (usually the genito-urinary system or the eye). The smears are stained by the method of Gram and are examined for typical gram-negative diplococci, biscuit or coffee bean in shape, of fairly large and generally uniform size, lying in clusters within the bodies of polymorphonuclear leucocytes (pus cells).

Unfortunately other organisms resemble the gonococcus, even to being characteristically intracellular. Among them are the micrococcus catarrhalis, micrococcus flavus, micrococcus pharyngis siccus and the meningococcus. The first three are commonly found in the upper respiratory tract, where the micrococcus catarrhalis sometimes has mild pathogenic qualities. The colon bacillus may occur in coccus like forms and lie within leucocytes. Under some conditions even the staphylococcus and the pneumococcus may stain imperfectly and appear to be gram-negative diplococci.

Organisms which resemble, but are not the

gonococcus may be found in the genito-urinary tract, especially of the female. It is the opinion of many physicians who treat women that the micrococcus catarrhalis may be pathogenic in the female genito-urinary tract. So little scientific study has been made of the genito-urinary flora that neither the significance nor the actual identity of these gonococcus-like organisms is known. They serve only to make the diagnosis of gonorrhea more difficult. Few experienced physicians will make a diagnosis of gonorrhea upon the discovery of organisms resembling the gonococcus without supporting history or clinical evidence.

With this introduction it may be more readily understood why the laboratory technician who has not personally taken the smear nor seen it taken, and who knows nothing of the clinical aspects of the case, cannot state that the organisms found in smears are the gonococcus. It must suffice to state that they resemble the gonococcus. The physician has the responsibility for giving the laboratory findings their proper weight as evidence.

THE INTRACELLULAR GRAM-NEGATIVE DIPLOCOCCUS

It is the experience and opinion of the Neisserian Medical Society that

1 Intracellular gram-negative diplococci which resemble the gonococcus, in smears from the male genito-urinary tract, warrant the diagnosis of gonorrhea if the history of the infection or the clinical evidence is presumptive of gonorrhea.

2 Intracellular gram-negative diplococci which resemble the gonococcus, in smears from the genito-urinary tract of the adult female, warrant the diagnosis of gonorrhea only if supported by one or more of the following

*The Neisserian Medical Society of Massachusetts has a membership of some seventy physicians who treat gonorrhea. The *New England Journal of Medicine* is its official organ. The Society believes that one important duty of the specialist is to give the whole medical profession the benefit of his larger experience in his field. This particular contribution is the first of what the Society hopes will become a complete series in review of the whole management of gonorrhea in both male and female.

fairness of depending upon evidence of infection with gonorrhea as evidence of guilt

Probably the only sound medico-legal use of evidence of gonorrheal infection is in the case of the infection of children in institutions as the result of outbreaks of the disease. In such a case it is important to have complete cultural study made as there is a growing opinion that some of these outbreaks are due to the micrococcus catarrhalis following a general outbreak of upper respiratory infection.

NEVER GIVE THE PATIENT A LABORATORY REPORT

It should be clear that since laboratory reports require interpretation by the physician to be used properly in diagnosis and that since "negative reports may have little or no significance the patient should never be given a copy of a laboratory report. Prostitutes have been known to re-date them and use them indefinitely as evidence of freedom from infection. People may acquire gonorrhea immediately after a "negative examination, in fact the disease

may be in the incubation period at the time the negative smear is obtained. Many states have laws prohibiting the giving of any written statement to a patient which might be interpreted to indicate freedom from infection.

THE PHYSICIAN AND THE MICROSCOPE

The microscope is indispensable as an aid in the diagnosis, treatment and control of gonorrhea. The physician who attempts the management of this disease without the aid of his own microscope is at as great a disadvantage as the physician who attempts the management of diseases of the heart or chest without a stethoscope.

Public laboratory examinations of smears preferably should be depended upon as checks of and not substitutes for, examinations made by the physician with his own microscope.

There is much more to the microscopic examination of a smear than search for the gonococcus. No laboratory report can describe satisfactorily for the physician what he himself should have seen.

BRONCHO-PULMONARY SUPPURATION*

BY ERNEST B. EMERSON, M.D.

IT is not the purpose of this paper to more than epitomize the diagnosis of two conditions frequently mistaken for pulmonary tuberculosis.

Every chronic disease has a beginning and, in many instances, if recognized sufficiently early may be alleviated or cured. Subjective symptoms are usually the first evidence of thoracic disease and are as important as the physical signs, a point too often overlooked if the x-ray and adventitious sounds in the chest are to be interpreted correctly. It should be remembered that with the exception of a positive sputum, there is no symptom or sign alone diagnostic of tuberculosis and that the failure to detect x-ray evidence and physical signs or to find tubercle bacilli does not prove the absence of a tuberculous lesion.

The correlation of past history, symptoms and signs is of the utmost importance for an early and correct diagnosis of any pulmonary lesion and even then one may be led astray unless every means of direct examination has been employed. A detailed history including that of the family with its possibility of direct exposure to infection, the patient's past history with reference to influenza, pneumonia, the infectious diseases and surgical operations, particularly those of the upper respiratory tract, including tooth extractions, together with a searching inquiry with regard to the mode of

onset and the progress of the patient's present complaint make up the background for a diagnosis.

Bronchiectasis and lung abscess are two diseases not infrequently diagnosed as pulmonary tuberculosis, which if recognized sufficiently early and appropriate treatment instituted, may be palliated at least or permanently cured, not treated, the end results may be as crippling and disastrous as untreated tuberculosis. The effectiveness of any treatment depends on an early diagnosis and accurate localization of the lesion.

More or less characteristic symptoms of tuberculosis, bronchiectasis and lung abscess are described and if an individual case always conformed to the classical description, the diagnosis would be simplified. Unfortunately, however, the symptoms in a given case may present an excellent picture of any one of the three. A diagnosis of tuberculosis may be made frequently on a single examination or a period of observation may be required before one may venture an opinion. The same is true with regard to lung abscess and bronchiectasis: fatigue, cough, expectoration, hemoptysis and emaciation naturally suggest tuberculosis. They are also symptoms of bronchiectasis and lung abscess. Hemorrhage from the lower air passages is generally thought of as pathognomonic of tuberculosis, yet it is a common symptom of lung abscess or bronchiectasis. The characteristic fetid odor of bronchiectasis and lung abscess is not always present and its absence is of little significance one way or the other. Frequent colds, bronchitis and nasal sinus infections in

Read at the meeting of the American Sanatorium Association, Eastern Section, October 6, 1933.

*Emerson—Superintendent, Rutland State Sanatorium. For record and address of author see This Week's Issue, page 355.

ner and the public are entitled to the benefit of the doubt. If there is any doubt that the patient may have gonorrhea, the condition should be managed in such a way that neither the patient nor any other person may suffer the consequences of an untreated infection. The presence of pus in a smear establishes the doubt. Until its origin is accounted for, the doubt continues to exist.

Culture

No practical method has yet been devised whereby smears may be sent to central laboratories for culture. The gonococcus will not live long enough on a dry swab to reach a distant laboratory alive. No culture medium has been devised which can be tubed and distributed to physicians in the way culture medium for the diphtheria bacillus is distributed. The absolute identification of the gonococcus requires the use of other complicated laboratory procedures after the organism has been cultured. The vaginal flora is usually so rich in other organisms that the gonococcus is overgrown beyond recovery. In its present development the culture of the gonococcus as a routine or even a frequent laboratory procedure is impracticable.

The Complement Fixation Test (The Schwartz-McNeil Test)

Some physicians use this serological test in the diagnosis of gonorrhea. The majority, however, find it of questionable value. In principle it is similar to the Wassermann test for syphilis. That it is not more widely used is due to at least three important limitations.

1 It is usually negative in acute gonorrhea because sufficient changes have not occurred in the blood.

2 It frequently remains positive for months and sometimes years after the disease has been cured, so far as any other laboratory or clinical evidence can determine.

3 It may be falsely negative, even in chronic gonorrhea, although the patient, clinically and bacteriologically, has gonorrhea.

If typical organisms cannot be found in smears, and the complement fixation test is positive it serves as one more confirmatory test when the history, clinical findings and other laboratory findings are presumptive of gonorrhea.

THE MEDICO-LEGAL CASE

Too much emphasis has been placed upon the importance of gonorrhea as evidence of marital infidelity or of rape. For many reasons the alleged presence or absence of gonorrhea in one or the other party to the suit is entirely unreliable as evidence of guilt. Some of these are the following:

1 Most men who have gonorrhea acquire it before marriage. Through neglect or inade-

quate treatment they are not cured although they may be without obvious symptoms. They usually think they are cured. Infection of their wives may be delayed for weeks or months if the condom is used or medicated douches or contraceptive jellies. Or wives may become infected soon after marriage but not come to medical attention until pelvic complications occur months later or not until the birth of the first baby. Consequently a diagnosis of gonorrhea in husband or wife is not evidence of marital infidelity.

2 Many women acquire gonorrhea before marriage. Gonorrhea is more often missed than diagnosed in women. Some women become apparently healthy carriers of the gonococcus and may infect a male only at times, especially near the menstrual period. For this reason, or through the use of contraceptives or by good hygiene the husband may escape infection until long after marriage. Thus the infection is not evidence of marital infidelity.

3 Gonorrhea in the female may exist for weeks, months or years before it comes to medical attention. Many gonorrheal infections in the male are weeks or months old before they come to medical attention. In either sex, the disease may never be seen or recognized by a physician. If either husband or wife is shown in court to have gonorrhea, it is still impossible to say who had it first.

4 The infection may be discovered by one physician in one party and missed by another physician in the other.

5 If more than one physician has attended the patient only the one who has negative findings may be subpoenaed.

6 Social studies of gonorrhea in husbands and wives have frequently disclosed extramarital sources of infection for both.

7 The willingness of physicians to accept single "negative" smears as conclusive makes the laboratory evidence valueless.

8 By the time the case comes to court, the infection in the guilty party may have been cured, but may still persist in the innocent one.

9 In an alleged rape, if the victim is a female child, the infection may have been acquired, as most of these infections are, from some member of the family or from attendants or associates and not from the defendant, even though he is found to have gonorrhea. If a man attempts intercourse with any of the hundreds of little girls who have gonorrheal vulvovaginitis, the fact that he is found to have gonorrhea cannot be evidence that he committed the act, he may have had it previously. Further, the girl's infection cannot be sworn to be gonorrhea simply on the evidence of positive smears.

Courts and the legal profession in general should be informed of the uselessness and un-

lent symptoms, heal spontaneously, assume a chronic course or terminate fatally. There are no characteristic physical signs of lung abscess. There may be dullness, change of breath sounds and râles, and signs of a cavity if rupture occurs into a bronchus.

Many patients find their way into sanatoria and hospitals with a history of cough, hemoptysis, and a ready-made diagnosis which inevitably influences one's judgment. They may spend months or even years in an institution labeled tuberculosis, or after prolonged observation but with some margin of doubt may be diagnosed chronic bronchiectasis or lung abscess, and relegated to a chronic ward or sent home for a life of invalidism. On the other hand, a diagnosis may be established without a long period of observation or neglect, and the consequent loss of time before proper treatment is instituted.

The chest roentgenogram is recognized as an indispensable aid in the diagnosis of thoracic disease. The bronchoscope has not received so much attention as a diagnostic aid. It is generally associated with the removal of foreign bodies from the air passages rather than an instrument of precision for diagnosis and treatment. The work of Chevalier Jackson in the removal of foreign bodies has been spectacular, yet the removal of foreign bodies today is a side-issue compared with the value of this instrument for diagnosis and treatment. Bearing in mind the chance of missing evidence of tuberculosis in the upper lobes, a lesion in the lower lobes almost invariably points to some condition other than tuberculosis. The routine x-ray, physical signs and symptoms are not always conclusive. It is in this group of lower lobe lesions in young adults with a history suggesting tuberculosis that the bronchoscope, for diagnosis and treatment, is a most valuable aid and in the hands of a qualified operator, is practically without danger. I believe that all obscure cases, particularly those with lesions in the lower lobes, with more or less indefinite symptoms and negative sputum, should be bronchoscoped and lipiodol films made before subjecting the patient to a long and tedious period of observation. Its use in frank tuberculosis is not indicated or advocated, nevertheless, it is an essential part of sanatorium equipment.

There is no clear-cut line between medical and surgical treatment for these diseases, early tuberculosis may heal under medical treatment alone, bronchiectasis may be alleviated by medical and bronchoscopic measures to such a degree that the hazards of surgery are not justified on the chance of a complete cure, and an abscess may drain and heal spontaneously, or may yield to bronchoscopic treatment. Inasmuch as the question of treatment, either medical or surgical, follows a diagnosis, it is obvious that a sanatorium clinic is no longer a one-man job for the internist but a problem for a medical group

including the internist, the surgeon, the laryngologist, the roentgenologist, and the dentist.

The following cases admitted to the Rutland State Sanatorium illustrate the similarity of onset of the three diseases mentioned in the foregoing as well as the value of the bronchoscope for early diagnosis and treatment.

CASE 1—M. D. A.

Aged 19 single, student, admitted Nov 3, 1931

Family History

Sister died of tuberculosis in 1930. One sister said to have healed tuberculosis. Seven people in four rooms.

Past History

Bronchitis at one year of age. measles.

Present Illness

One year before admission he had a severe "chest cold" followed by an unproductive cough for four months, when he began to expectorate. Following an x-ray examination nine months before admission he was told that he had pleurisy in



CASE 1 FIGURE 1

Film on Admission

A thin marginal collapse of the right lung. A heavy homogeneous shadow obliterating the right cardiophrenic angle.

the left base. He was aspirated but no fluid found. Expectoration was then frequently blood streaked and there were several two-ounce hemorrhages three months before admission. He was treated in two sanatoria before admission to Rutland and was under artificial pneumothorax on admission. This was continued for three months when the lung was allowed to re-expand inasmuch as the pneumothorax was ineffective and the general absence of the symptoms of tuberculosis: negative sputum, temperature pulse and x-ray suggested some other condition.

Bronchoscopic examination and lipiodol injection by Dr. George A. Rice showed dilatations of the bronchi in the right lower lobe. He was transferred to the Massachusetts General Hospital in June 1932. Lobectomy was performed by Dr. Edward D. Churchill. He was returned to the

early childhood and later years are more often the antecedents of bronchiectasis and pulmonary suppuration than of pulmonary tuberculosis

The differential diagnosis is not always easy, particularly in a young adult with a history of exposure to tuberculosis. Sufficient time for study and observation should be taken provided it does not run into the indefinite before applying direct and fairly positive means of diagnosis

Bronchiectasis and chronic lung abscess are so closely associated in their development and clinical manifestations that it is often difficult or impossible to determine which is the primary disease and which is the complication

Bronchiectasis is a dilatation of the bronchi occurring for the most part in the lower lobes. Abscess is an area of pulmonary suppuration. There are many theories concerning the mechanism of the development of bronchiectasis which may be epitomized by recognizing three factors operative in its production

- 1 A distending force
- 2 Traction on the bronchi from without
- 3 Softening of the bronchial wall

It is rarely seen in the upper lobes, and when it does occur in the upper lobes is usually associated with tuberculosis. The dilated bronchi may indefinitely retain their integrity, or ulceration of the bronchial wall may be followed by perforation and abscess formation in the peribronchial tissue. On the other hand, bronchiectasis may follow abscess formation and in time overshadow the original lesion. Broncho-pulmonary suppuration aptly describes lesions of this type

Bronchiectasis is visualized as a chronic disease of long standing with little hope for any material relief and none for a cure. As a rule, the onset is insidious and is characterized by a long-standing cough which finally becomes paroxysmal and is accompanied usually by large quantities of fetid sputum. It may begin in early life and exist over many years with only moderate symptoms and little disability. The sputum may have little or no odor and may be blood streaked, or there may be copious hemorrhages. The constitutional disturbances over long periods are slight as compared with the exacerbations and wasting of tuberculosis. As time goes on, however, there may be fever, loss of weight, cardiac embarrassment, and the patient becomes a bedridden invalid. Medical treatment has little to offer and frequently these cases have gone too far for surgical relief. In place of the insidious onset, with no definite date of beginning, the symptoms may be relatively acute and parallel those of early tuberculosis, or other pathogenic infection of the lung with fatigue, cough, expectoration, hemoptysis, fever and loss of weight

Clinically the early cases may be difficult to differentiate without prolonged observation dur-

ing which time they are drifting toward chronic invalidism. The physical signs are more or less indefinite and a routine x-ray examination is not always conclusive except in so far as the location of the lesion is shown in the lower lobes which is a diagnostic point. A lower lobe lesion without evidence of tuberculosis in the upper lobe is almost always non-tuberculous, whereas a lesion in the apex or upper lobe should be considered tuberculous until otherwise proved. Out of 7189 admissions to the Rutland State Sanatorium since 1917, I recall but one positive case of basal tuberculosis without upper lobe involvement

Abscess of the lung is rarely primary and may occur at any age but is most common from the thirtieth to the fiftieth year. Streptococci, staphylococci, Friedlaender's bacillus, fungi, oral spirochaetes, and other organisms have been identified with the disease. It is important to differentiate infection, by the pyogenic organisms which do not produce gangrene, and infection by the spirochaetes, fusiform bacilli and vibrios. The latter group may respond to arsphenamine therapy and are more likely to be associated with gangrene

David T. Smith in 1212 recorded cases reports 338 (28%) following tonsillectomy, 188 (15%) other operative procedures, 277 (23%) post-pneumonic, 138 (11.5%) develop insidiously, 18 (1.5%) aspiration of foreign body, 161 (13.5%) miscellaneous causes, and 92 (7.5%) cause unknown. Of this group, 576 (43%) were directly traceable to surgical procedures and it is quite possible that at least a part of the pneumonic group may have been indirectly postoperative

Clerf cites a series of 172 cases of lung abscess, 70 per cent of which followed operation

The disease seldom follows lobar pneumonia. Abscess may vary from pin-point size to that of an entire lobe. There are two theories as to the mode of infection

- 1 Aspiration by the bronchial route
- 2 Embolic infection from a distant focus of infection

Abscess may be acute or chronic, unilateral or bilateral, single or multiple, and may occur in any part of the lung but is most common in the lower lobes. The variable etiology and pathology explain the manifold symptoms

Lung abscess should be considered, if in the presence of an acute respiratory infection there is an exacerbation of the symptoms, or, following infection elsewhere respiratory symptoms develop. The onset is usually acute with fever, cough and pain in chest. Pneumonia may be suspected but in abscess there is a septic toxemia, chills and sweating. The diagnosis may not be apparent until the sudden appearance of purulent, fetid sputum followed by some subsidence of the symptoms. The disease may be characterized by relatively mild or most viru-

of sputum but his general condition remained about the same that of a chronic invalid. He was sent to the Massachusetts General Hospital one year after admission and lobectomy was performed by Dr. Edward D. Churchill. Since return to the sanatorium his general condition has improved and the sputum has reduced to about one dram of thin mucoid material in 24 hours. An early bronchoscopic examination would have cleared up the diagnosis with a considerable saving of time in the institution with proper treatment.

CASE 3—M G T

Aged 31 single bookkeeper, admitted May 6 1930

Family History

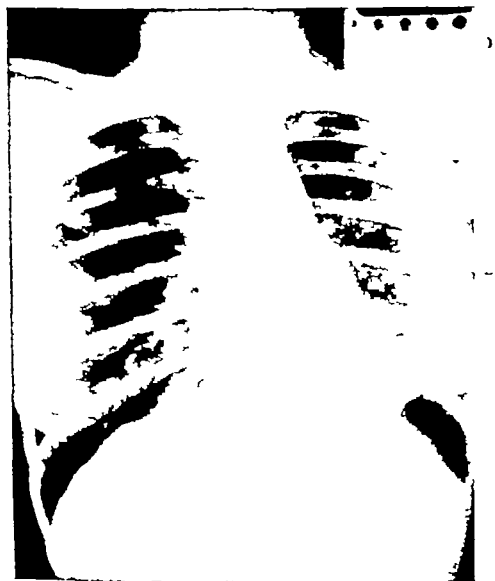
No history of contact.

Past History

Pertussis and measles in infancy diphtheria at eight influenza in 1918 tonsillectomy in 1920 appendectomy in 1921 has had a constant sense of fatigue for fifteen years

Present Illness

Began to cough one year ago but denied expectoration until six months later. X-ray and sputum examinations were reported negative at this time. A second sputum examination three months before admission was reported positive for tubercle bacilli. She was sent to another hospital where she took bed treatment until admission to Rut



CASE 3 FIGURE 5
Film on Admission.

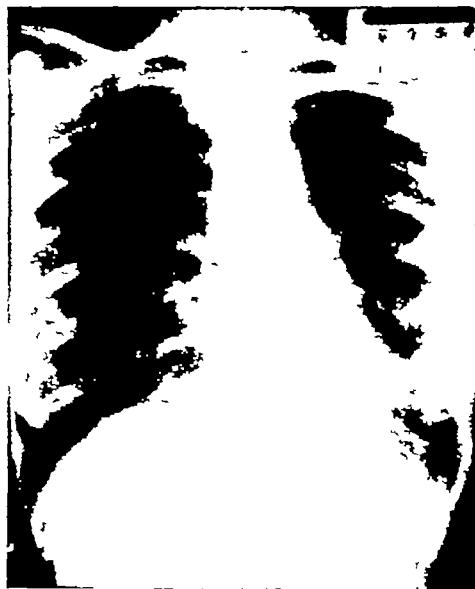
The left mediastinal border drawn downward and to the left to the midportion of the left diaphragm. The left cardiophrenic angle obliterated.

land. On admission there was about one-half ounce of thin yellowish sputum. She had occasional night sweats pain in the left side 99° evening temperature and she was six pounds under maximum weight.

Physical Examination

Fairly well-developed and nourished. Slight dullness from the fourth to the eighth dorsal spine on the left with bronchophony bronchovesicular respiration and moist râles. A diagnosis of tuberculosis based on the history of positive sputum

was made. The diagnosis was questioned within a few weeks on account of the atypical course of the disease negative laboratory findings and the location of the lesion in the lower lobe.



CASE 3 FIGURE 6
Lipiodol Film.

Shows fusiform dilatations of the bronchi on the left.

Thirty-nine sputum examinations cultures and guinea pig inoculations were negative for tubercle bacilli.

Since discharge from the sanatorium March 7 1931 two years ago she has again been reported as having a positive sputum but during this period has not lost a day from her work and has gained twenty-five pounds.

Summary

The history is that of tuberculosis. Present illness could not be traced to the influenza in 1918. There is no doubt as to the presence of bronchiectasis as shown in the Lipiodol film. Tuberculosis may also be present but it is not evident. The case is cited as illustrating the importance of using every means for correct diagnosis and the possibility even then of error. It also raises the question as to how much weight should be attached to the numerous negative laboratory findings and her present condition against the reported positive sputum tests prior to admission and after discharge.

CASE 4—G

Aged 24 single moth inspector admitted Feb 22 1928

Family History

No history of tuberculosis contact.

Past History

Children's diseases pneumonia at six influenza and pneumonia at 14 always subject to frequent sore throats tonsillectomy one year before admission.

Present Illness

Has had a hacking cough with expectoration occasionally blood-streaked for seven years before admission not definitely connected with the at-

sanatorium in November, 1932, for convalescence, and discharged Jan 13, 1933, apparently well

Summary

This case presents a misleading history with contact and poor living conditions as a background for infection onset with a chest cold followed by persistent cough, expectoration,



CASE 1 FIGURE 2
Lipiodol Injection

Shows two sacculated pockets a little to the right of the costophrenic angle

and hemorrhages all suggest a characteristic picture of tuberculosis in a young adult. The bronchoscopic examination and lipiodol films cleared up a questionable diagnosis and the patient has probably been saved a life of invalidism. He is now without symptoms

CASE 2—C G

Aged 21, single, draftsman, admitted Aug 11, 1931

Family History

Mother died of tuberculosis when the patient was three years of age

Past History

Pneumonia at two, measles at six influenza at eight.

Present Illness

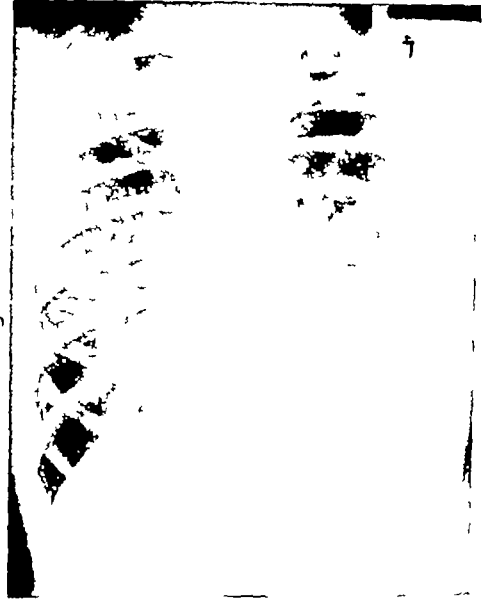
Onset of disease five years ago with unproductive morning cough later accompanied by two or three ounces of yellowish sputum hemoptyses three years ago and two years ago at that time had an x ray and was told to stop work which he did for two months. One year ago had a severe cold with increase of expectoration and an eight ounce hemorrhage has had numerous hemorrhages since that time. He took treatment at another sanatorium in 1930 and in 1931, before admission to Rutland. He lost eight pounds

Physical Examination

Well-developed and nourished. Slight dullness posteriorly over the left lung and from the sixth spinous process downward with diminished breath sounds and medium rales. The physical signs were not characteristic. Temperature 97° to 98°, pulse 70, 4-6 ounces of sputum, not fetid. Sputum examinations and guinea pig inoculations negative for tubercle bacilli

Summary

A history of contact in infancy suggests a diagnosis of tuberculosis, but a duration of five years in the absence of any definite



CASE 2 FIGURE 3
Film on Admission

Left border of pericardium pulled downward to the left. Costophrenic angle partially obliterated. Bronchial markings prominent in left base extending to costal border



CASE 2 FIGURE 4
Lipiodol Film

Shows dilated bronchi posterior to the heart and extending nearly to the costal border and below the dome of the diaphragm on the left

upper lobe lesion and the general condition were incompatible with the progress of a tuberculous lesion in a patient of this age. A tentative diagnosis of bronchiectasis was confirmed by bronchoscopic examination and lipiodol injections by Dr George A. Rice. Aspiration of the bronchi reduced the amount

hemorrhages for three days Took bed rest treatment at home for one year, during which time there were numerous hemorrhages Gained eight pounds in weight. Admitted to another hospital in October, 1929, where she remained until admission to the Rutland Sanatorium seven months later No history of foreign body or of operations. Temperature reported 99° to 100° before admission

Physical Examination

Well-developed overweight Clavicular fossae well filled. Diminished expansion of left base Slight dullness below the left scapula with increased vocal fremitus A few medium and fine



CASE 5 FIGURE 10
Lipiodol Film.

Shows sacculation of the bronchus and a fluid level below the diaphragmatic dome

moist râles in the left axilla Temperature range 97.5° to 101° Pulse 75 to 110 In the following three months there were four hemorrhages varying in amount from one to five ounces Sputum frequently streaked. No fetor No tubercle bacilli found

Summary

There was no history of a severe respiratory or distant infection to suggest lung abscess A cold followed by a persistent cough expectoration fever loss of weight, and hemorrhages is a characteristic history of early tuberculosis in a young adult The symptoms after admission were compatible with those of tuberculosis but negative laboratory findings with x ray and physical signs limited to the base with no evidence of a lesion in the upper lobe suggested some condition other than tuberculosis A bronchoscopic examination and lipiodol films by Dr George A. Rice confirmed a diagnosis of broncho-pulmonary suppuration. Bronchoscopic aspiration resulted in relief of symptoms Patient was discharged from the sanatorium June 21, 1931 and is now working

CASE 6—V V

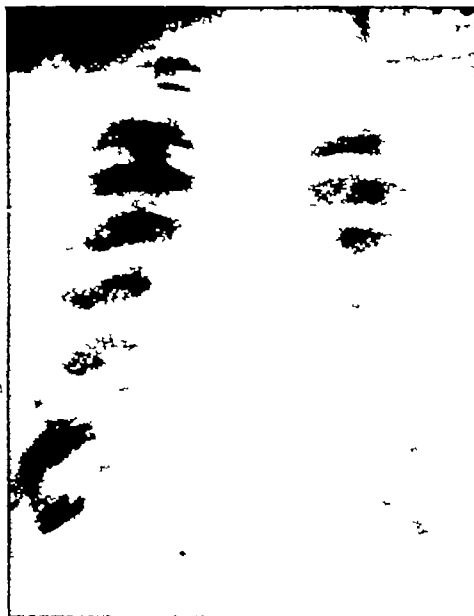
Aged 34 married weaver admitted Sept. 26 1930

Family History

Father died of tuberculosis

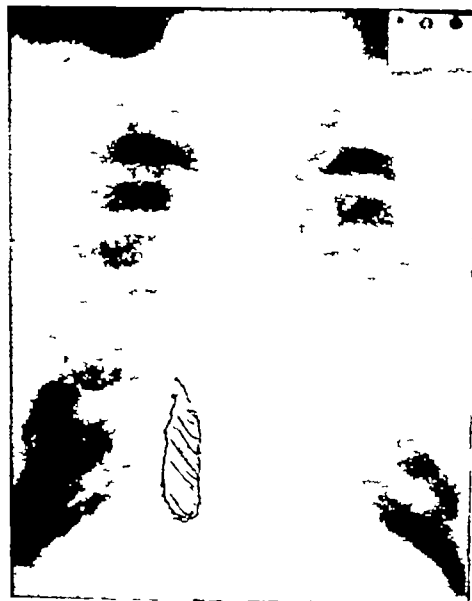
Past History

Pneumonia twice during childhood Pneumonia followed by influenza eleven years before admission, since which time he has had continuous cough and expectoration. No history of operations or of tooth extractions obtained



CASE 6 FIGURE 11
Film on Admission

Heavy bronchial markings and blurring of the right cardio-phrenic angle Left bronchi somewhat dilated No foreign body observed.



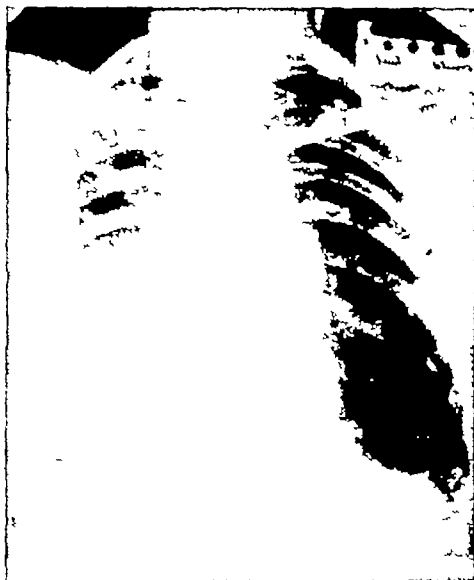
CASE 6 FIGURE 12
Lipiodol Film.

Showed a sausage shaped shadow extending from about the level of the 8th rib downward below the diaphragm as indicated by the diagram in the illustration.

tack of influenza, had a three-ounce hemoptysis three months before admission. No loss of weight or strength, no sweats, slight dyspnea following exertion for past month.

Physical Examination

Well developed and nourished. Dullness on the right from eighth dorsal spine downward with



CASE 4 FIGURE 7

Film on Admission

Homogeneous shadow below the 8th spinous process

increased tactile and vocal fremitus, bronchovesicular breathing and medium râles. Temperature range 97.5° to 98.6° (occasionally 99°). Pulse range from 70 to 90. One-half ounce expectora-



CASE 4 FIGURE 8

Lipiodol Film.

Shows a heavy dense shadow in the same area

tion, no characteristic odor. Throughout residence he was a persistent and profuse bleeder. During a period of thirty-three months he lost 311 ounces of blood, not including streaks. Artificial pneumothorax was given but without sat-

isfactory results in controlling the hemorrhage. Phrenicectomy was performed in October, 1929, followed by only slight improvement. Bronchoscopic examination by Doctor Rice revealed marked swelling and injection of the right lower lobe bronchus. The bronchus was aspirated several times and sulpharsphenamine given without material benefit.

He was transferred to the Massachusetts General Hospital in January, 1931. Lobectomy was performed by Dr. Edward D. Churchill. Readmitted to the sanatorium May 7, 1931. Discharged Nov. 20, 1931, wound healed, scanty expectoration.

Since discharge expectoration has cleared up. He is apparently well and driving a truck.

Summary

This case was erroneously diagnosed tuberculosis on admission. Because of negative laboratory findings, no apical involvement, and the absence of symptoms indicating active tuberculosis, the diagnosis was doubted. Bronchoscopic examination and lipiodol films confirmed a diagnosis of broncho-pulmonary suppuration.

CASE 5—M. L. H.

Aged 22, single, teacher, admitted May 23, 1930.

Family History

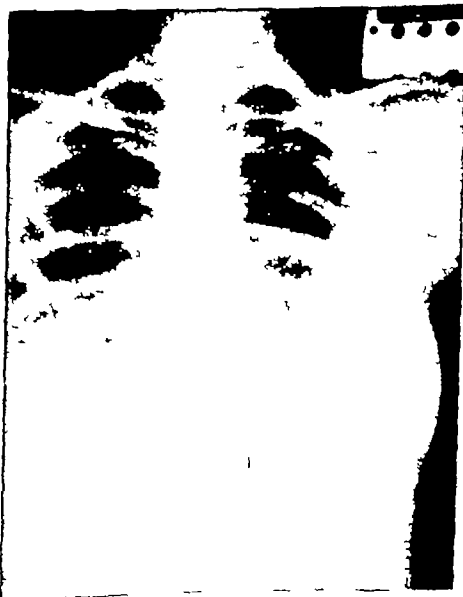
No history of contact.

Past History

Scarlatina at four, measles and tonsillectomy at five, otherwise well and athletic.

Present Illness

Caught cold twenty-one months before admission, in bed three days, then returned to her work. Ten days later cough and expectoration developed and was in bed four weeks. X-ray in September 1928, reported negative. One week later had



CASE 5 FIGURE 9

Film on Admission

The left mediastinal border is pulled downward to about the midportion of the left dome of the diaphragm. There is a homogeneous haziness from about the 8th spinous process downward. Heavy bronchial markings in the right base.

corded his incidence as four per cent. In 22 surgical appendices removed by Erdmann⁸ from children under 10 years of age, four contained oxyurids. Nev⁹ reported an incidence of three in a series of 100 operated appendices. Hanley⁹ saw only one full of worms in 500 appendices. Deaver¹⁰ also found one in 500 appendices and Deaver and Ravdin¹¹ in another series found slightly less than one per cent. Crile¹² failed to find any pinworms in a series of 1000 appendices.

In studying the bacteria of appendices Warren¹³ stated that at the Boston City Hospital they have approximately two per cent of "parasitic worms" in appendices, but he does not state the type of worm. Howe¹⁴ in a clinical and pathological study of 100 appendices found two which contained pinworms.

Gordon¹ presented an analysis of oxyuriasis in 20,969 extirpated appendices received for routine diagnosis at the Pathology Laboratories of the University of Michigan during the period July 1, 1894 to December 31, 1930. The incidence was 221 (1.05%). Females were much more commonly infected than males.

Infestation was found to be more common during the first decade of life than in later years, and is almost unknown in Michigan after the forty-sixth year. There was no significant seasonal predilection for the occurrence of oxyuriasis. The incidence was significantly greater during the last decade than during the earlier years of the period under survey.

MATERIAL AND TECHNIQUE

The present study concerns the incidence of oxyuris vermicularis in operated appendices received for routine examination in the laboratory of the Worcester City Hospital. All appendices were received in ten per cent formalin. During the last three years (1930 to 1932 inclusive) 1639 appendices were examined and 101 (6.1%) of these were found to contain varying numbers of pinworms.

An important point concerning the examination of these appendices should be mentioned here. All appendices were slit open lengthwise and the contents were spread out on the board. In this way the presence or absence of pinworms was immediately noted. The incidence would have been much lower if I had counted only those which were found on microscopic examination because in most instances the contents of a section of appendix were washed out in transferring it through the various solutions. I feel sure that the incidence in the reports in the literature would have been higher if this technique had been followed.

AGE AND SEX INCIDENCE

In this series 78 (4.7%) were females and 23 (1.4%) were males, thus showing that there

are more than three times as many females as males infected with oxyurids.

The age groups in this series show that the highest incidence is in childhood. Following are the appendices containing oxyurids arranged by decades.

TABLE I

Age groups	1-10	11-20	21-30	31-40	41-50
Oxyuris Appendices	14	50	21	8	8

This table shows the highest number of oxyuris appendices in the age group 11-20.

In order to give a more accurate idea of the incidence of oxyurids, the percentage of these in the total numbers of appendices for each age group is given in Table II.

TABLE II

Age groups	1-10	11-20	21-30	31-40	41-50
Percentages of oxyuris appendices	9.8%	8.8%	5.3%	3.2%	6.3%

TABLE III

Age groups	Appendices without oxyuris		Appendices with oxyuris	
	Male	Female	Male	Female
1-10	77	65	3	11
11-20	208	356	11	39
21-30	141	254	4	17
31-40	90	153	2	6
41-50	47	79	3	5
51-60	19	27	0	0
61-70	5	16	0	0
71-80	1	0	0	0
Total	588	950	23	78

TABLE IV

Winter	
December	5
January	12
February	15
Spring	
March	13
April	15
May	4
Summer	
June	6
July	2
August	5
Fall	
September	8
October	10
November	6
Total	101

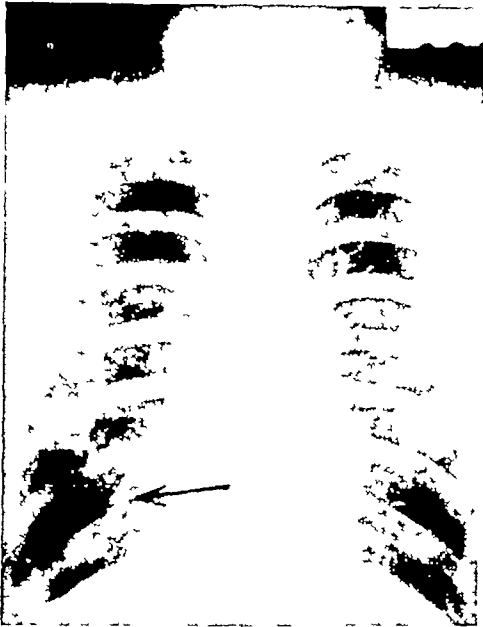
A further analysis of all appendices examined in this study is seen in Table III. In this table the oxyuris appendices in one group and all other appendices in another group are analyzed by sex and age groups.

Present Illness

Eight months ago caught cold, since which time there has been a marked increase in cough and expectoration with streaking, some loss of strength, but no loss of weight.

Physical Examination

Well developed and nourished. No change of chest expansion noted. No dullness, numerous sibilant and sonorous râles over entire chest, foul purulent expectoration 4-8 ounces daily.



CASE 6 FIGURE 13

Film Taken After Absorption of the Lipiodol

Shows a sharply defined peglike shadow in the 9th interspace interpreted as residual lipiodol. This was found to be a tooth at autopsy in another hospital.

temperature range 97° to 98°, pulse range 70 to 80.

Seven months after admission there was an exacerbation of symptoms, probably bronchopneumonia. A tentative diagnosis of bronchiectasis was made on admission. There was some improvement at first following bronchoscopic aspirations by Dr George A. Rice. They were later discontinued because of questionable benefit. Discharged May 17, 1931, unimproved.

Summary

This is a case of broncho-pulmonary suppuration apparently following pneumonia and in influenza eleven years ago, whereas, the probable cause was a tooth found at autopsy in another hospital.

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ENTEROBIUS VERMICULARIS OF THE APPENDIX*

BY RAYMOND H. GOODALE, M.D.†

THE literature reveals numerous reports on *Enterobius vermicularis* of the appendix, but the author has seen no complete report of the incidence of this parasite in Massachusetts.

Enterobius vermicularis or pinworm is cosmopolitan in its distribution. The incidence in a population depends not so much on the climate or public sanitation as on the personal habits of the individuals. So far as is known, man is the only natural host.

LITERATURE

There is a marked variation in the incidence of pinworms of the appendix in different countries. It is interesting, too, that different authors in the same country report a variation in the incidence.

It does not seem necessary to give a complete

bibliography, but a summary of the incidence in European literature as given by Gordon¹ will be presented.

For Great Britain the total reported incidence of appendiceal oxyuriasis is 97 of 523 appendices or 18.5 per cent. In France the incidence for 800 autopsies and 179 extirpated appendices was 11.9 per cent. The German literature contains a large number of reports. The incidence varies from 0.2 per cent in a series of 1000 operated appendices reported by Aschoff² to 41.8 per cent in 110 appendices reported by Fischer.³

In North American literature the following reports indicate that the pinworm is found fairly regularly in the appendix. Cecil and Bulkley⁴ examined 148 appendices from children two to 15 years old. This series consisted of 129 surgical and 19 autopsy specimens. They found oxyuriasis in three of the autopsies and in 17 of the surgical appendices. Harris and Browne⁵ found the parasites in 22 of 121 consecutive appendices received for diagnosis. Garlough⁶ re-

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†Goodale—Pathologist, Worcester City Hospital. For record and address of author see "This Week's Issue" page 388.

muscles and bones. Proliferative changes may be found in bones at a distance from joint surfaces, particularly where tendons are inserted.

The pathological changes will not be considered here in detail, for all of you can find such information in the textbooks. It is necessary to know, however, that there are two principal types of arthritis. One is the proliferative or atrophic type which may produce ankylosis. The other is the degenerative or hypertrophic type which does not produce ankylosis but may produce limitation of motion by mechanical obstruction. The proliferative type occurs more often up to middle life, but may be found at any age. The degenerative type occurs after middle life.

HISTORY

In obtaining the history of arthritides one should not be content with a history of joint condition alone. It may be that the patient is facing a crippled future and every effort should be made to elicit a history which covers all the possibilities of the source of the present trouble. No symptom is too insignificant to be considered.

SYMPTOMS

These may be divided into two parts: those which are present before the onset of visible joint changes and those which occur afterward. The prodromal symptoms of arthritis are few but significant and most important. They are slight stiffness and soreness of the neck muscles often accompanied by headache, and later on there is general muscular stiffness in the morning. This may be followed by inability to close the fingers or there may be noticeable weakness in the knees on going up and downstairs. As the disease progresses soreness and stiffness increase and the joints become painful and swollen.

In the ankylosing type there is fluid fusiform swelling, thickening of the joint tissues, limitation of motion, and frequently beginning deformities. The muscles supplying the joints become atrophied, the skin shiny, the hands and feet are apt to be cold and clammy and covered with perspiration, the skin of the palms may be reddened or bluish, the nails have ridges on them and there may be localized tremors in groups of muscles. The x-rays will often show spurs in the cervical vertebrae and the bones look atrophied.

In the degenerative type the joints usually swell as the result of some injury. There are fluid and limitation of motion from mechanical obstruction but no thickening. The x-rays show thinning of the joint cartilage and an increased density of the bones. Spur formation or lipping is marked. An x-ray of a joint showing symptoms should be compared with the companion joint with no symptoms. Nearly always

the symptomless joint will show changes as marked as those in the affected joint.

TREATMENT

The treatment of arthritis should be constant and vigorous from the onset of the first symptoms. It is a medical problem from the beginning. It becomes a surgical problem when joint changes have occurred, *but even then it is a medical problem more than ever*.

The medical treatment depends on finding the cause such as focal infections, abscessed teeth, diseased tonsils, infected sinuses, etc. A word of warning—If the arthritis is very active, infected areas should not be disturbed until the patient's general condition has improved. Sometimes disastrous results occur, if sound judgment is not used about the general condition of the patient.

Occupations. Occupations which keep the patient under extreme stress and strain must be changed or eliminated. Occupations which seem to produce local irritation in the affected joints must also be given up. Patients having large, prominent abdomens, hollow backs, round shoulders, knock knees and pronated feet may be improved by measures designed to correct these bad habits.

In *hyperthyroidism*, surgery is usually indicated. In *hypothyroidism* the use of thyroid extract is helpful. Disturbances of this gland probably affect the function of the digestive tract. In the first case the intestine is overstimulated and in the second it is sluggish.

Nutritional disturbances probably account for a very high percentage of the cases of arthritis. There is not much doubt in the minds of many of us that such disturbances may result in proliferative changes in joints. These disturbances may be traced to the wrong kind of foods, poorly balanced meals, and bad habits of eating. For example, many people eat more carbohydrates than can be absorbed and the result is intestinal fermentation, with an acid, foul-smelling, ill-formed stool containing undigested starch. A restriction of carbohydrate intake will often relieve the swelling and discomfort in many arthritic joints. Any food which is indigestible upsets the whole digestive function. Too much food and too rich food are also to be warned against.

Quack diets, "thirteen-day diets" and the like have no sound physiological basis when one stops to think of the chemical processes going on in the intestinal tract during digestion. The only thing to be said of such diets is that a patient who has been overeating would be better off temporarily on *any* diet rather than the one on which he usually exists. The whole question of diet depends on getting the required kind and the proper amount of food into a patient each day so that his cell metabolism will be carried on in a normal manner.

INCIDENCE BY SEASONS

The seasonal incidence is not especially significant (Table IV) There is however a slight decrease during the summer months The total number of appendices received during the summer months does not show a corresponding decrease We must, therefore, consider an increased exposure to infection with pinworms during the school year

DISCUSSION

In this series of oxyuris appendices there is a predominance of females (78 cases) over males (23 cases) The oldest patient is a 49 year old female The youngest is a 5 year old male It is only rarely that an adult has clinical symptoms of pinworm infection, but in this series infection was not infrequent in the 21-30 year group In the next two decades there are fewer cases, and there are none after the fifth decade This agrees with Gordon's¹ figures

The pathology in these appendices is striking because practically all of them showed a hyperplasia of the reticulum cells of the lymph follicles A few had foci of lymphocytes in addition Only two had polymorphonuclears in the wall, but no pus in the lumen

SUMMARY

In a series of 1639 consecutive appendices, 101 (61%) had oxyuris vermicularis in varying numbers in the lumen The female patients are infected more than three times as often as male patients The highest incidence of infection occurs during the first two decades The seasonal incidence suggests infection during the school year

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VERMONT STATE MEDICAL SOCIETY

GENERAL ASPECTS OF CHRONIC ARTHRITIS*

BY FRANK R. OBER, M.D.†

CHRONIC arthritis occurs more often than any other chronic disease It is estimated that four per cent of the population in the north temperate zone is more or less affected with this disease, which means that there are about twenty arthritic patients to every practitioner of medicine These figures should be startling to every social, medical and philanthropic organization in this country They do not seem to be startled, for there is a sad lack of interest in a condition which causes so much crippling, suffering and economic distress

It is the purpose of this paper to discuss arthritis from a general standpoint without going into many details

ETIOLOGY

- 1 There is no single specific cause of arthritis It has been observed in an infant of ten months but it is more prone to develop after thirty years of age

*Read at the annual meeting of the Vermont State Medical Society at Barre Vermont October 5 1933
†Ober—Clinical Professor of Orthopedic Surgery Harvard Medical School For record and address of author see This Week's Issue page 388

- 2 It seems to occur more often in the temperate zone
- 3 Certain occupations seem to injure joints in such a way as to produce arthritic changes
- 4 Postural defects and static disturbances are often forerunners of this disease
- 5 It may be seen in disturbances of the endocrine glands, especially the thyroid
- 6 It may result from apparent and concealed infections
- 7 Nutritional disorders and digestive disturbances apparently play a large part in its causation
- 8 Perhaps the most important factors, and those which often escape consideration, are emotional disturbances,—fear, worry, chronic fatigue, etc

PATHOLOGY

Arthritis is a constitutional disease which probably affects every cell in the body Its most prominent signs are chiefly located in the joints, but if one studies his patients he will often find changes in the skin, nails, eyes, tendon sheaths,

DR. HAYS I think Dr Ober handled this subject very nicely. But one thing I think we don't do to help those arthritics is to get them early. They are medical cases and I think that not half of the cases that go to surgery should go there. They do things that should not happen. These cases should be taken care of early in their condition and if you are going to take care of them you must check from head to foot in a general way and not be satisfied with taking out teeth and tonsils. In this way if we could spread the news, there could be much done for arthritis.

DR. COLBY The medical profession probably has not learned the latest treatment. I have a patient that has been taking crazy water and I expect before long the medical profession will not have these millions on their hands.

DR. RICKER What I have to say will come better this afternoon than now. I think there is nothing new, that is worth reading on arthritis or focal infection. Most of us learn from personal experience. I don't know Dr Ober's private life but I assume that for the most part he sees cases of arthritis under serum treatment, and this and that that has been done. There are those of us here who see cases before anything is done. Please do not disregard the fact that many cases have infected roots and tonsils removed, and get well, and don't get into Dr Ober's office.

DR. TEMPLETON As a general practitioner I do think that many patients having arthritis are relieved by removal of their focal infection. Yet we have a great deal to learn for many of our cases of arthritis are due to emotional and intestinal disturbances. I will cite one case. The husband was an invalid and the wife the only source of his care. She was taken ill with a very severe attack of arthritis. I put her on the routine arthritic treatment yet she went bad day by day. I sat down, and looking at her I seriously meditated what was best to do because it was a most serious condition. After a very careful inspection of her general appearance particularly the abdomen I struck on this treatment. I cut out all the arthritic treatment and put her on *naux* (vomica) and dilute hydrochloric acid. The results that I had were most amazing. Shortly afterward she was able to take care of herself and husband and the arthritic condition disappeared.

I think it well for the practitioner to carefully inspect the general condition of the patient and carefully weigh the use of cathartics and alkalies.

DR. BEECHER I enjoyed Dr Ober's paper and since he was kind enough to emphasize one point

of my paper I would like to emphasize one in his paper. We have had three cases within three years, in which many teeth were extracted, resulting in general sepsis and death. Dr Ober said something about the slowness of the food passing through the intestine, and insisted that the patient have a normal stool each day. I remember one patient that we had in a clinic whom we asked whether her bowels were regular. She said Yes, they move once a week. That may have been perfectly normal. If three meals a day constitute an artificial habit, one movement a day may be just as artificial.

DR. WILSON I am sorry I didn't hear the entire paper and I don't know whether Dr Ober brought up the point that the age at which most of this chronic arthritis appears is significant. Most of them in women come at age of menopause, and I don't know whether the doctor brought out the condition that possibly the endocrine changes come at that time and may have something to do with arthritis. I would like to hear what he has to say on this.

DR. OBER Dr Ricker mentioned the focal infection idea. I of course stated that focal infections are concealed infections and have to be taken care of. Personally I have seen what seemed to be a miracle after the removal of a tonsil or abscessed teeth but if you have a patient with diseased teeth and diseased tonsils removed and they still have arthritis what are you going to do next? This focal infection idea has been before the public for about twenty-five years and everybody thought the removal of focal infection was going to solve the arthritic problem but it has not. If people have focal infections, no matter what is going on in that body, the infection should be taken care of, if the patient is in a condition to have it done.

Dr Templeton spoke about the use of drugs. All of these drugs relieve pain and make the patient more comfortable and I think that is necessary. A patient who has a good night's sleep is apt to be more uncomfortable than the one who has been twisting and turning as the latter has exercised his joints and the former slept and did not exercise. Regarding the use of small doses of cinchophen I think one man reported two deaths. There have been several other deaths reported in the literature. Many of these patients have deficiency in hydrochloric acid in their stomachs.

The point Dr Beecher has made—most people have movements of the bowels almost any time. If the form of the stool is normal it may be all right whether it is once a week or once in two weeks, and I think there have been cases on record where it has gone longer than that.

NORTHEASTERN MEDICAL SOCIETY

ON January 12, 1934 the second quarterly meeting of the Northeastern Medical Society met at the Elks Home in St. Johnsbury.

The program started with an enlightening talk by Dr. William Ricker on Andreas Vesalius. He first vividly portrayed the time in history when Andreas Vesalius lived taking up a few of the medical practices of Galen which were

then in vogue. He continued then with the birth of Andreas Vesalius telling of some of his childhood experiences as the son of a Physician and then told of his anatomic studies and the compilation of his historic anatomy. Dr. Ricker presented at the meeting for inspection a second edition of Vesalius' work which was published in 1555.

In considering disturbances in the large intestine, we find that constipation and, oftentimes, diarrhea are associated with arthritis. In the first instance, the progress of the intestinal contents is too slow and in the second, it is too rapid. The one thing, to be aimed at here, is to secure *normal* evacuation of the bowel. The use of cathartics, lubricants and irrigations will not restore the bowel to normal physiology. This can be done by the use of a proper diet and vitamins, especially B, and that which is most important, the cultivation of normal and regular habits.

Frequent emotional disturbances, such as chronic disappointments, trouble, fear, worry, and chronic fatigue probably have a great deal to do with maintaining the arthritic condition. Just why this is true is not entirely clear, but it is probably through their affect on the function and chemistry of the digestive tract. Those who are constantly dealing with arthritis seem to have a higher percentage of success when they consider these emotional conditions seriously.

In the care of arthritics, the surgeon finds his place in preventing deformities, restoring motion and in the supervision of the care of the joint by the physiotherapist. In the proliferative type of arthritis the joints must be moved at frequent intervals within the limits of discomfort. The muscles which control the function of the affected joints become atrophied and they should be actively exercised. The very acute cases must be kept at rest. In these cases, counterbalanced splints, applied to the extremities in comfortable positions, may be very useful in restoring motion. Many deformities, when there is some motion present, may be corrected by osteotomies and capsuloplasties. Ankylosed joints may have arthroplasties done on them to restore motion. This can be done in the elbows, fingers, hips and knees.

In the degenerative type of arthritis, obstructing spurs and loose bodies in the knee joints may be removed. These joints are apt to be irritable after trauma. The treatment is rest, followed by physiotherapy. Many patients with limitation of hip abduction do well when given daily stretching in abduction and exercises to improve the tone of the hip muscles.

(Slides illustrating the various conditions were shown.)

CONCLUSION

Every practitioner of medicine, including the specialist, is in more or less frequent contact with arthritic patients, and far too many of these doctors feel helpless in coping with the disease. These patients are too often told that nothing can be done to relieve them, and they are dismissed casually, having received no constructive help or advice.

When such a situation as this exists, it is small wonder that these unfortunate people, having lost hope, clutch at any straw which seems to promise relief. They take all sorts of advice from well-intending friends and neighbors and hence they are often led into the folds of quacks, faddists and healers.

Chronic arthritis is becoming more and more a live subject, and those of us who are interested in it find newer methods of approach. It should be our duty to broadcast knowledge that is slowly, but surely, being acquired to combat a disease which is so universal and affects so many in our country, having an onset incidence nearly twice as high as any other chronic disease.

There are many reasons for the lack of interest by the practitioner in patients afflicted with arthritis. Through the ages, innumerable panaceas and methods of therapy have been proposed, nearly all of which have ultimately failed, or at least have failed to relieve or cure every patient. The result of all this has been that many practitioners have become more and more convinced that nothing is of any use, and interest ceases.

The estimate that there are about 4,000,000 arthritics in this country ought to be a challenge to every practitioner of medicine. A few are slowly obtaining better results year by year, and these are being obtained as a result of painstaking work and care. The old panaceas have been scrapped and instead of pouring drugs into their patients to relieve symptoms, they are carefully studying them in an effort to find out what abnormal condition or conditions may be present. Such conditions once discovered, they proceed to eliminate or eradicate them.

The whole social and economic situation of the arthritic would be helped if all the medical and philanthropic societies would combine in an effort to produce some plan that would bring proper medical treatment to him. Such a plan has been suggested. It includes a small central hospital with a group of physicians, nurses and physiotherapists working as a unit with the *family doctor*, and bringing to bear the best medical and surgical advice at a minimum cost. The so-called Vermont plan in poliomyelitis has worked well and is known the world over. Using this scheme as a fundamental basis, it would seem possible to save a great deal of suffering, crippling and economic loss, which would outstrip by far anything that has been done for any other chronic disease up to the present time. The need is urgent. Let us lead the way.

DISCUSSION

PRESIDENT ALLEN Now, since each one of you has 20 arthritics under his care let's get a report and discussion.

fort involved in the injection of serum into the lumbar spine. The worst features of this method of treatment are obviated by using the cistern route, first devised by Ayer in 1919. It is now possible to give treatment in this manner as an office procedure. In general, the method is as follows: After a preliminary course of mercury or bismuth and iodide, the patient is given an intravenous injection of neosphenamine. Fifteen minutes after this injection 50 cc of blood are withdrawn, allowed to clot, and about 20 cc of serum poured off. This is inactivated and then reinjected at some time during the course of the next few days, into the cistern. At the time of the cistern puncture enough spinal fluid may be taken so that the above tests can be done after each injection. These injections may be done every week or two, until the spinal fluid is clear or the doctor has decided that it is no longer worth while to give the treatment.

Finally, Dr Viets stated that in general the outlook for a patient with neurosyphilis is much better today than ten or fifteen years ago. We now look forward to curing a certain number of cases and to stopping the activity of the disease in an even larger number, keeping it well under control. A few patients will advance rapidly into the more serious types of neurosyphilis in spite of any form of treatment. Only one form of treatment has been mentioned, but there are many others of equal importance, which cannot be considered at the present time.

Dr Burton E. Hamilton of Boston then spoke on "Progress in the Treatment of Chronic Heart Disease."

He stated that —*Carotid Sinus Disease*, as it is called, may be considered a newly discovered heart disease. It is to be suspected where sudden brief fainting attacks occur. There may be convulsive movements. It should be considered especially where a diagnosis of Stokes-Adams Syndrome is suspected. If the seizures can be produced by pressure upon the carotid artery where it bifurcates close beneath the angle of the jaw the diagnosis of carotid sinus disease is established. Some proved cases have responded to simple procedures for protecting the carotid sinus region against pressure such as pressure from a high stiff collar. Others have responded to atropinization or administration of adrenalin or adrenalin-like drugs. A few have been successfully treated by surgical denervation of the carotid artery in the region of the carotid sinus. Cases of carotid sinus disease are rare, but it is clearly important not to overlook them since they can be successfully treated.

Probably even rarer are patients with stubborn congestive heart failure associated with *chronic adhesive pericarditis* who have been relieved by *cardiolysis*. Adhesive pericarditis should be considered among other possibilities

where there is congestive failure and oedema of a stubborn nature. A few extraordinarily successful results have followed surgical treatment of the adhesive pericarditis in a small number of carefully selected cases.

The rôle of the thyroid in heart disease has recently attracted increased interest. In *hypothyroidism* though there are often changes in the electrocardiogram, and in the heart size, and though these changes return toward normal with treatment of the hypothyroidism by thyroid feeding, it is clear that hypothyroidism untreated does not tend to cause angina pectoris or congestive heart failure. There is then no such thing as the hypothyroid heart as a clinical problem. In fact, treatment of hypothyroidism by thyroid feeding in some patients who have never had heart failure may be followed by breathlessness or symptoms of angina pectoris.

As everyone knows, *hyperthyroidism* increases the work of the heart. Where it occurs in older patients, it frequently causes attacks of, or persisting, auricular fibrillation, and, in some such cases it causes congestive heart failure of a stubborn nature. Successful surgical treatment of hyperthyroidism almost always results in complete clinical cure of the cardiac symptoms. Oftentimes it is difficult to recognize an underlying hyperthyroidism in the presence of congestive heart failure. Though heart failure due to hyperthyroidism is rare, it is not so rare that one may not expect to find it in the course of general practice more than once in a lifetime. And where it is found and successfully treated, the results are a source of great gratification to all concerned. One should suspect it particularly where one encounters auricular fibrillation and stubborn heart failure in emaciated pigmented elderly women. If one is alert, one will suspect it many times before one finds it once.

It has been shown recently that complete *extirpation of the normal thyroid gland* will greatly ameliorate the symptoms of congestive heart failure and angina pectoris. The only important objection to this procedure is the obvious one that extirpation of the thyroid gland is followed by symptoms of myxedema. At present, we do not know how much of a penalty patients would have to pay in terms of myxedema for the benefits to the heart from complete extirpation of the thyroid gland. Elaborate work is now being done in particular at the Beth Israel Hospital in Boston on this subject. It is to be hoped that when we know more about it we shall have another useful therapeutic weapon at our disposal.

Dr Hamilton next pointed out that though drugs may ameliorate cardiac symptoms to some extent, and rare cases may appear where surgical intervention causes dramatic results, with rare exceptions the successful treatment of cardiac patients consists in stubborn control of the daily life by carefully planned *régimes*. To

Following the talk a delicious dinner was served

At 8 15 the meeting was called to order. The minutes of the last meeting were read by the Secretary and approved. Dr Farmer suggested that the next meeting be held at Barton in April. This met with unanimous approval. Drs Cleasby, Sherman, and Rublee were appointed to see about arrangements.

President Blake then introduced Dr Henry R Viets of the Massachusetts General Hospital, who spoke on the subject of "Neurosyphilis a Clinical Problem." He first reviewed briefly the history of syphilis, noting the beginning of it in Europe, the last part of the fifteenth century, when it spread as an epidemic and became a devastating disease with a mortality of nearly fifty per cent. In the four hundred years since that time there has grown up a distinct immunity to syphilis and it seems not unlikely that each one of us has some natural protection against the disease. One sees, moreover, an increasing number of patients who have had the initial infection, followed by well-marked invasion of the central nervous system, and who have completely recovered without treatment. In other words, except for the scars left by such a disease as *tuberculous*, a patient of this type may present no indication of any activity of progress in the disease when first seen. The opposite, of course, is true, in that patients are recognized with active neurosyphilis who do not respond to the ordinary type of treatment, no matter how much is given and over how long a period of time. One of the important problems, therefore, in the adequate handling of a patient whose central nervous system has been invaded by the syphilitic virus is to ascertain at the start all the facts that can be gathered about his disease. This material ought to indicate to the doctor whether the patient has active neurosyphilis or whether the disease is in a quiescent or even a "burnt-out" stage. The basis for this estimation is upon five points, as follows:

(1) The history of the initial infection, largely important for an estimation of the time which has elapsed since the disease entered the body and the patient presents himself to the doctor for treatment of his neurosyphilis. Other things being equal, it is reasonable to assume that the longer the disease has been harbored by the individual, the longer it will take to eradicate it.

(2) Inquiry should be made in regard to the type of treatment received during the first and second stages of the disease. Was the patient adequately treated? What form of treatment was used? Most cases of neurosyphilis give a history of grossly inadequate treatment during the primary and secondary stages.

(3) To what extent have the various systems of the body been affected by the disease other than the nervous system? Is there evidence of vascular syphilis, syphilis of the bone, serious disease of the liver, etc? To determine these factors a thorough physical examination with the collection of laboratory data is necessary.

(4) An investigation of the family history sometimes gives us important information regarding the natural resistance the patient might have to the disease. Some families show very little resistance and one can note a long series of catastrophes of one type or another, all the result of invasion by syphilis.

(5) The most important test for signs of activity of syphilis in the nervous system is the examination of the spinal fluid. In many cases it is practically impossible to decide about the treatment necessary without having these data at hand. The important tests done upon the spinal fluid are as follows:

(a) The immediate counting of the cells. This information is our best guide to the activity of the disease. A large number of cells present in the spinal fluid indicates an active meningitis, the easiest form of neurosyphilis to cure. A few cells, on the other hand, indicate a deep parenchymatous infection, difficult to adequately treat.

(b) Globulin in the spinal fluid is present in almost all forms of neurosyphilis and is much increased in the parenchymatous degenerations.

(c) The Wassermann test, usually positive in most cases, is confirmatory of the diagnosis, but does not help very much in estimating the activity of the process.

(d) The colloidal gold test is of considerable value in estimating the progress made by treatment and the general prognosis of the case. The initial gold colloidal test before treatment does not by any means make certain the diagnosis of any one type of neurosyphilis. If, however, the colloidal gold test is strongly positive before treatment is inaugurated and remains so after the patient is adequately treated for six months or a year, the conclusion may be drawn that one is dealing with a parenchymatous type of neurosyphilis and the prognosis is not good.

So important are these tests in the spinal fluid that we have come to depend upon them not exclusively but certainly with a great degree of security. This being the case, it seems inadvisable to treat any patient with neurosyphilis without a preliminary test of the spinal fluid and the frequent repetition of this test throughout the course of his treatment. A useful method of treatment, which combines the best of the ordinary antiluetic therapy with a frequent examination of the spinal fluid, is the intracistern serum treatment. This method, formerly used as intraspinal treatment, has now been largely abandoned on account of the pain and discomfort.

N Y and graduated from the Hahnemann Homeopathic Medical College at Philadelphia in 1894

Soon after graduation he settled in Pawlet, Vt., where he practiced for 17 years, and met and married Bertha Sherman on June 19, 1901 Two daughters were born to them

In 1916 he moved to Springfield, Vt. where he built up a large practice and took an active part in community affairs He held many offices at various times in the Masonic Order He was also a member of the Modern Woodmen of America, Sons of the Union Veterans of Springfield, and the Vermont Medical Association

Besides his widow and two daughters he leaves a brother Dr E H Denman of Berkeley, California, and a sister Mrs Mary D Nelson of Pawlet, Vt

SOMERS — H. E. SOMERS, M.D. aged 52 years practicing physician in Newport, died at his home November 17 1933 after a few days illness of angina pectoris

Dr Somers was the son of Homer and Clara Wiggins Somers of Irasburg He was a graduate of the University of Vermont Medical College Dr Somers was a World War Veteran having enlisted January 23 1918 He was a first lieutenant in the Medical Corps 540 Aero Squadron He was discharged in 1919 with the rank of Captain He held a commission as Captain in the Reserve Officers for several years He was one of the most active in the organization of Newport Post of the American Legion and was a member of the Vermont Medical Association and a Mason

Dr Somers is survived by his wife, Mrs Dorcas Somers their two children Joyce and Homer Somers and by an older daughter by a former marriage Miss Ruth Somers of Claremont N H There are also three sisters to mourn his loss Mrs H. C. Berry of Brattleboro Mrs D. M. Croft of Middlebury and Mrs B. C. Brown of Three Rivers, P. Q.

SEARS — F. W. SEARS, M.D. aged 74 years Professor of Neurology at the College of Medicine University of Vermont, and a prominent physician of Burlington, died January 3 of this year

Dr Sears was born in Morristown N Y, in 1859 He was graduated from Adelphi Academy in 1876 and attended Yale and Amherst Colleges receiving an A.B. degree from the latter in 1881 He received his Doctor of Medicine degree from the University of Vermont in 1888 and later took many postgraduate courses He also studied at Harvard Johns Hopkins University, and in London Paris Munich and Vienna

In 1890 he began the practice of medicine in Waterbury He had been Professor of Neurology at the University of Vermont since 1912 He was a member of the Boston Society of Neurology and Psychiatry the New England Psychiatric Association and the Vermont State and Chittenden County Medical Societies He was always considered by his as

sociates to be a student, an excellent teacher and to have a genius for friendship

Dr Sears left his widow, Elizabeth Hollis, whom he married in 1881 and one brother, Superior Judge Charles B. Sears, of Buffalo N Y

ROBERTS — G. XAVIER ROBERTS M.D. died December 18 1933, at his home in Chester He was born near Brattleboro on March 10 1871, and received his early education in the public schools of Brattleboro He then went to Dartmouth College and received his degree of Doctor of Medicine from the University of Vermont in 1896 He later took postgraduate work

He married Miss Cora Miller of Newfane, who died in 1916 One son, Raymond Frank Roberts of New York City, was born to them On August 2, 1918 Dr Roberts married Miss Abbie Eleanor Brann of Coopers Mills, Me

After practicing medicine in Hartford Conn and Brattleboro he came to Chester in 1910 During the World War he served in the Medical Corps and was discharged with a rank of Captain

Dr Roberts was a member of the Masonic bodies of Brattleboro of the American Legion a trustee of the Chester American Legion, a member of the Congregational Church the American Medical Association and the Reserve Officers Association He was also a member of the Windsor County Medical Society and the Vermont State Medical Society

Burial was held in Brookside Cemetery He is survived by his widow and one son Raymond Roberts

PERRAULT — J. G. PERRAULT, M.D. aged 61 years died at his home in St. Albans, Vt. January 31, following a few days' illness of pneumonia

Dr Perrault had been a successful practitioner in that city for the past 35 years He was born in St. Pie Quebec, April 19 1872 He attended college in St. Hyacinth Quebec, and then spent two years at the University of Vermont and three years at Laval University of Quebec in Montreal coming here from the Canadian metropolis

Besides practicing his profession the deceased was active in politics and served as a member of the city council and as health officer

Dr Perrault was prominent in fraternal circles being a member of the Independent Order of Foresters St. Albans Council No 297 Knights of Columbus St. Aerie No 1,205 Fraternal Order of Eagles, St. Jean of Baptists Society Catholic Order of Foresters and Modern Woodmen of America He was a member of the Franklin County Medical Society

The deceased leaves his widow Josephine Chartier Perrault three daughters Alexandra, Germaine and Emmaline four brothers Gadfois of Milton, Quebec Phillias of St. Pie Quebec The Rev Alfred C. of Damase Quebec Albert of St. Hyacinth Quebec and one sister Sister St. Emile and several nieces and nephews

discuss them adequately is difficult. The simplest régime should consist of many components. The most important single point is the avoidance of fatigue,—hours in bed, rest after meals and during the day should be specifically prescribed to fit the particular case. The amount of exertion should be carefully controlled. It is not enough to advise a patient not to make sudden, violent or unusual exertion, but these exertions should be definitely described. For example,—the exertions incident to operating an automobile are common causes of disaster to cardiac patients,—shoveling out of a drift, changing a tire, etc. Specific instructions should be given to cover this. The proper diet for a cardiac has many factors. For example—balanced ingredients, bowel control, weight control, avoidance of gorging or over-distention of the stomach, control of anemia. This point, control of anemia, has proved of prime importance in some cases. Attention to the daily regime has been shown to be the main factor in reducing the death rate in pregnant cardiac patients and in postponing disaster in patients with angina pectoris.

Dr Hamilton referred particularly to work described in the publications in the appended bibliography.

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MISCELLANY

VERMONT DEPARTMENT OF PUBLIC HEALTH
December, 1933

The incidence of communicable diseases during December is as follows: chicken pox 226, diphtheria 4, measles 297, mumps 76, scarlet fever 69, typhoid fever 3, tuberculosis 8 and whooping cough 257.

The Laboratory of Hygiene reports a total of 12,234 examinations during the month, these being:

152	Examinations for diphtheria bacilli
33	" " Widal reaction of typhoid fever
18	" " undulant fever
95	" " gonococci in pus
168	" " tubercle bacilli
339	" " syphilis
70	" of water, chemical and bacteriological
177	" " water, bacteriological
78	" " milk, market.

6	Examinations for milk submitted for chemical only
2	" " foods
1	" " drugs
4	" for courts
9	" " courts, miscellaneous
71	" " miscellaneous
1	Autopsy to complete death returns

In the Division of Communicable Diseases 26 cases of gonorrhea and 16 cases of syphilis were reported. Three hundred and fourteen Wassermann outfits and 186 gonorrheal slides were sent out.

The nurses of the Division of Poliomyelitis After Care report 80 patients seen in December, 78 of whom were visited in their homes. Twelve doctors were consulted, one cast removed, three patients admitted to the Children's Hospital, three patients admitted to the Audubon Hospital, three patients discharged from the Children's Hospital, four patients discharged from the Audubon Hospital and one patient discharged from the Massachusetts General Hospital. Nine orthopedic corrections were made to shoes and three pieces of apparatus altered. The Vocational Worker of this Division reports sales amounting to \$113.87.

Five towns of the state were visited by the State Advisory Nurse assisting in the examination of children in schools and meeting with Home Demonstration Groups.

OBITUARIES

WADE—H M WADE, M.D., son of William and Adeline (Kneeland) Wade, was born February 20, 1852, in Waterbury Vt., and died January 2, 1934 of injuries received in an automobile accident.

Dr Wade passed his boyhood and received his primary education in the common schools of Waterbury and Stowe. He graduated at Barre Academy in 1875 and entered the academic department of the University of Vermont, where he graduated in 1879, and graduated from the Medical Department of the same institution in the class of 1883. He at once entered upon the practice of his profession in Starksboro, being at the time of his death the longest established physician in this vicinity, and also health officer.

He is survived by one brother, Charles Wade, of Hopkins Minn., two nieces, Miss Alexina A Wade of Hopkins, Minn., and Mrs Helen Adams of Spring Valley, Minn., and two nephews Arthur M Wade of Canogo Park, Calif., and Henry H. Wade of Hopkins Minn.

DENMAN—HORACE BRADFORD DENMAN, M.D., aged 64, practicing physician in Springfield for 17 years, died suddenly in December 1933. Dr Denman was born in Scottsville N Y, April 26, 1869. He completed the courses in the common schools of Scottsville and attended Starkey Seminary at Seneca Lake,

We thought the case to be one of cortical infection of the kidney with anaphylactic shock of some description associated with the repeated transfusions

DR J DELLINGER BARNEY This case is that of a very sick boy who had been watched for a long time without any definite conclusions being reached. When he came in here it seemed with this picture and physical examination, as if he had a perinephric abscess, or as has been said a cortical abscess, but the exploration itself had failed to reveal any pus outside the kidney. Just how much pus was in or around that kidney I do not know. But it seemed as if the only thing to do was to drain. The patient was far too sick and the indications too obvious to consider cystoscopic investigation.

I operated under local anesthesia, enlarged the scar of the previous incision and exposed the kidney completely. I got my hands around the entire kidney and decapsulated it without any difficulty. There was an irregular contour of the kidney suggesting masses either of tumor or of inflammatory tissue. In the end I discovered at the lower pole a mass of broken down necrotic kidney tissue which was opened and drained with the escape of a quantity of necrotic material and pus. No other abscess cavities could be found on exploring the surface of the kidney or its surrounding tissues. It seemed to me that the only thing to do was to take the kidney out, but the boy was certainly in no condition to have stood a nephrectomy at that time. We thought that the only practicable thing at that time was to get him into better shape so that either a nephrectomy could be done later or that possibly we might succeed in clearing up the condition without further surgical interference.

For the first few days after operation his general condition was very much improved. Then he began to go from bad to worse. His abdomen became a little more distended than it had been. It was obvious that more surgery would have to be done, but it was equally obvious that no more surgery could be done until he was in better shape. Therefore we transfused him in the hope of getting him into better shape, with the result which you know.

I may say that it was interesting that that pressure defect in the left renal pelvis corresponded with similar pressure defects in neoplasms of the kidney and as I have found to my surprise and sorrow, in intrarenal cysts, which produce such flattening and deformity.

DR JAMES C WHITE Can you differentiate by x-ray marked distention from organic occlusion?

DR HAMPTON I think so. I think we can say that the ureter and kidney pelvis were perfectly open.

DR WHITE I mean the intestinal tract

DR HAMPTON I think with a tumor of that size the intestine would fill with gas and would be dilated. A definite differentiation of occlusion and ileus cannot usually be made by gas shadows alone.

DR BARNEY Dr Hampton, was there anything in this x-ray film or in any subsequent film which would show any enlargement of the heart or the pericardial cavity?

DR HAMPTON We did not get a chest and heart examination. I am sorry to say. We had a 40 inch film and it is a portable. We can sometimes estimate the size of the heart in a film like that. What do you think, Dr Holmes?

DR GEORGE W HOLMES It looks a little broad.

DR BARNEY Clinically we found no evidence of fluid in his chest or of pericarditis, both of which things were found at autopsy.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Perinephric abscess
Cortical abscess of left kidney
Anaphylactic shock following whole blood transfusion

ANATOMIC DIAGNOSES

Renal abscess left, with extension to perinephric region
Operative wound, drainage of renal abscess
Pyelonephritis, left
Generalized peritonitis
Pyoureter, left
Hydrothorax, bilateral
Pulmonary collapse, right and left basal
Bronchopneumonia
Hydropneumothorax

PATHOLOGIC DISCUSSION

DR TRACY B MALLORY The autopsy showed one lesion that had been predicted and several others that had not been suspected. The kidney on the left side weighed 400 grams as against a normal of about 150, and practically the entire substance was necrotic. The upper half of it looked like an enormous carbuncle—a mass of intercommunicating small abscess cavities filled with bright green pus showing staphylococcus aureus on culture. There was no question that that was the primary lesion.

The immediate cause of death was I think entirely unsuspected. We found nothing that would point towards anaphylactic shock. The lungs were not dilated, in fact there was considerable collapse of both bases. There was a trace of bronchopneumonia in one upper lobe and some purulent fluid in one bronchus, but on the whole there was comparatively little in the lungs. Each pleural cavity contained about half a liter of clear fluid, straw colored except for slight tinging which I believe we were responsible for in removing the sternum. The pericardium contained 400 cubic centimeters of

CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D
F M PAINTER, A.B., ASSISTANT EDITOR

CASE 20071

PRESENTATION OF CASE

DR HARRY M SPENCE * This case is that of an eighteen year old student who entered the hospital complaining of pain in the left flank of seven weeks' duration

The family history is irrelevant. The past history is not significant, he had always been in fairly robust health.

Ten weeks before entry he developed a septic blister on his left heel. This was drained, and did well following that. Seven weeks before entry, three weeks after the blister was drained, he developed pain in the left flank region and began to run a septic chart. After a week of this the left kidney region was explored by his own physician under ether anesthesia, with the expectation of finding a perinephric abscess. The exploration was negative, but a cigarette wick was left in the hope that something would break down spontaneously. Subsequent to the operation, six weeks before he came in, he ran an afternoon fever, had some pyuria and was going downhill steadily and rapidly.

Physical examination showed an emaciated, frail boy with normal heart and lungs. The blood pressure was a trifle low, 88/60. The abdomen showed in the left flank a mass which was tender and did not move with respiration, thought to be either the kidney or the spleen. He had the scar of the previous operation in the left flank with a drain in it and a little sero-purulent material was coming out. It did not seem to be an abscess, that drainage seemed to be merely what the wick had provoked. Those are the essentials in the physical examination.

The temperature was 102°. The white cell count was 11,000. He had marked anemia—a hemoglobin of 50 per cent and a red cell count of 2,790,000. The smear was negative. The urine showed numerous white cells and a very slight trace of albumin. He was found to be in blood group II.

X-ray examination showed a normal chest. An intravenous pyelogram showed a normal right kidney, but we thought the left kidney was pressed inward and downward by an extrinsic mass.

Before operation the patient was given a trans-

fusion of 600 cubic centimeters of whole blood from a group IV donor. A previous transfusion had been given from a group IV donor with good effect.

For the following five days he continued to run a temperature of 104° to 103°. He drained very well from the wound but he was not progressing very rapidly. A third transfusion was decided upon to see if he would improve any. He was given 550 cubic centimeters of whole blood from a group II donor. As this transfusion was concluded he coughed and became cold, cyanotic and clammy. He did not complain of pain. He did not lose consciousness. He had an involuntary bowel movement. This was thought to be the result of the transfusion. He was given oxygen, and as a result of this measure came around fairly well, so that in a couple of hours he was able to sit up and read a newspaper. A few hours later he relapsed into a condition of more or less shock, and died twelve hours after the transfusion.

DR AUBREY O HAMPTON The diaphragm is relatively normal on both sides except that the right diaphragm is no higher than the left. The plain film of the urinary tract does not show either kidney outline or the psoas muscle. There are no areas of calcification. There is a great deal of gas in the bowel. The first film after the intravenous dye shows a normal right kidney pelvis, calices and ureter. The left kidney is not excreting so much dye as the right, so that we can say there is some impairment of function. We got a film later which showed a fairly definite deformity of the upper and middle calyces of the left kidney. There is a pressure defect here on this calyx.

CLINICAL DISCUSSION

DR HAMPTON I think we may have interpreted that film wrongly if we said it showed an extrinsic mass, because we have some evidence of involvement of the kidney itself in this impairment of function which we have demonstrated. So I should say the mass is in the kidney. We have had tumors that were as large as that and did not impair the function, so I suppose we could go on to say the thing is not a tumor.

DR SPENCE Dr Barney explored the kidney again under local anesthesia. The patient was in very poor condition from the time he entered, for that reason the exploration was not so extensive as it might have been. Some softened areas were found in the left kidney cortex at the lower pole. When incised about a dram of pus came out. The abscess cavity did not seem to communicate with the pelvis of the kidney. Drains were left in. The kidney was not taken out on account of the patient's poor condition.

*Assistant resident on the Urological Service

Examination showed a poorly developed and very emaciated woman, almost moribund, vomiting continually and complaining of very severe diffuse abdominal pain. There was marked tenderness in the left upper quadrant, but the abdominal wall was so tight that it was impossible to feel anything. The lower abdomen was also tender. No peristalsis was heard. She remained in the ward only twelve hours. Her pulse rapidly became weaker and she died.

CLINICAL DISCUSSION

DR. CAPPS. At her third entry it was thought that she probably had lymphomatous involvement of the spine with pain from nerve root pressure. When she was in the wards for the fifth time, in spite of the fact that we did not know exactly what intestinal lesion she had, because she had refused x-ray examination for the past two years, we thought that possibly she had some intestinal lymphomatous involvement which had been followed by perforation with general peritonitis. The discharge diagnosis was malignant lymphoma with a question of generalized peritonitis. All along we thought the left upper quadrant pain was due to nerve root pressure.

DR. AUBREY O. HAMPTON. She had an enormous number of x-ray examinations. There is the colon examination two years before the last entry. It shows a dilated colon full of gas and nothing else that we can be sure of. She had a skull examination which was negative. She had recurrent lesions in her chest which seemed to disappear, I suppose with x-ray therapy. I think this is the last chest film. Here is a nodule on the right lung which disappeared under deep x-ray therapy. At the last examination, about two months before death, she had a moderately high diaphragm particularly on the right, with diminished radiance of the bases of both lungs which looks as much like infiltration as anything else. I think it can be a little of both infiltration and pressure atelectasis. The heart shadow is quite small in all the films. I do not believe we found any mediastinal tumors at any time in these chest examinations. Here is a mass in the lung root but not in the mediastinum. She had bone changes in her skull and lumbar vertebrae which I think we thought were due principally to bone destruction, but the possibility of superimposed gas was brought up, because you might conceive of superimposed gas over the body of that vertebra making it appear diseased. In the anteroposterior view there is only a suggestion of pathology in the lumbar vertebrae but in the pelvis and the upper ends of both femora there are found definite bone lesions characterized by multiple small rounded areas of bone destruction and new bone formation. You can see a few nodules in that finger. One thumb shows it better than that.

DR. WILLIAM D. SMITH. I really have nothing to add. I saw the patient when she was obviously dying. The diagnosis seemed fairly well proved.

DR. EARLE M. CHAPMAN. The reason why this patient was sent to the Skin Ward at her fourth admission was that she had skin lesions over her body. In the Outpatient Department bromide was found in her urine. A provocative test with bromide in the Skin Ward did not produce lesions immediately, so the conclusion was reached that she did not have a bromide rash.

DR. GEORGE W. HOLMES. An interesting question was brought up in regard to treatment in this case. Radiation over the abdomen for lymphomatous masses if they involve the gut may result in rapid breaking down of the mass and rupture of the gut. I do not believe in this case that the treatment was the cause of the peritonitis.

DR. TRACY B. MALLORY. One of the most interesting points in this history is its extreme chronicity. She showed symptoms definitely suggestive of Hodgkin's disease sixteen years before her death and was known to have had the disease for eight years. I think it is rather characteristic of quite a number of Hodgkin's cases that it is almost impossible to say when the disease begins. It is quite common to get a history of one enlarged lymph node or one group of enlarged lymph nodes running back a long time before there are any general symptoms at all.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Lymphoblastoma
Peritonitis?

ANATOMIC DIAGNOSES

Hodgkin's disease
General peritonitis hemolytic streptococcus
Perinephric abscess
Arteriosclerosis, slight aortic
Leiomyoma of the kidney

PATHOLOGIC DISCUSSION

DR. MALLORY. The autopsy here showed a terminal general peritonitis, as had been suspected but it arose not from a rupture of the gut but from a rupture of a perinephric abscess. How long she had had this I think it is quite impossible to say, evidently quite a long period. There was a cortical abscess about three centimeters in diameter in the left kidney. About this we found a very large perinephric abscess with a quite obvious communication with the general peritoneal cavity. That abscess had a pretty dense, thick wall of inflammatory tissue. I think it must have been present for months, perhaps longer. Elsewhere we found very obvious tumor involvement of the liver and spleen and none at all of the gastro-intestinal tract. The retroperitoneal and mediastinal nodes were not involved. We did not examine the pelvic

clear fluid. When we came to the peritoneum there was also fluid, but this time it was opaque and tinged with green, and flecks of fibrin proved the diagnosis of peritonitis. I think without much question the acute terminal peritonitis was the cause of death. We were not able to demonstrate any communication between the abscesses of the kidney and the peritoneum. Either the infection had worked its way through without making any demonstrable opening or else it had reached the peritoneal cavity by way of the blood stream. I do not understand why the pericardial and pleural fluids should have been so extensive in amount and should have shown no evidence of infection. It was like the fluid one gets in cases of heart failure, not like that of acute pleuritis and peritonitis. I should imagine that fluid had been present only a few hours. We have had several cases in which it has been possible to get some idea of the rapidity with which fluid can accumulate. I remember in particular one case of myxedema where physical examination and x-ray both showed no evidence of any considerable quantity of fluid in the chest twenty-four hours before death. At autopsy we found practically four liters of fluid scattered between the various cavities of the chest. So fluid can accumulate under some circumstances with great rapidity, and I imagine it probably did here.

DR HOLMES: Was the heart itself enlarged?

DR MALLORY: The heart was small—295 grams.

DR BARNEY: May I say that the peritonitis was entirely unsuspected on our part. The only evidence that may be related to peritonitis was the abdominal distention which occurred a few days before death. It was much more extensive and persistent than usual but was thought to be due to gas, as it probably was to a large extent, there was not enough free fluid to demonstrate its presence. The peritonitis was not suspected, there was no obvious cause.

DR HAMPTON: He had an enormous amount of gas until they gave him an enema. The other film shows the change after the enema. We could not examine the kidneys at the first attempt.

DR HOLMES: It is surprising that a kidney so badly infected should excrete the dye.

DR MALLORY: Yes, it is astonishing. There was very little renal tissue that we could make out at autopsy.

CASE 20072

PRESENTATION OF CASE

DR RICHARD B CAPPS * This is the case of a thirty-eight year old married English housewife who entered the Emergency Ward complaining of severe abdominal pain and vomiting of two weeks' duration.

First to fourth admissions Eight years before her first admission, sixteen years before her final one, she entered another hospital for intestinal symptoms characterized by diarrhea, cramp-like pains and nausea but no vomiting or jaundice. Her appendix was removed. Her symptoms cleared for a year, then recurred. At about this time—she was unable to remember exactly—a painless lump appeared in the left parotid region. Persistent cramps and diarrhea recurred five years later and were more or less constantly present for a year. The following year the lump over the parotid began to grow slowly, but did not become conspicuous until two years later, two months before her entry to this hospital, when it began to grow more rapidly. In the interval it had been treated with Alpine lamp treatments in another hospital. During the last week before entry it had grown very rapidly and had become very painful. An x-ray examination for a stone in Stensen's duct was negative. Exploration showed that the mass consisted of a series of enlarged lymph nodes in the neighborhood of the parotid. The salivary gland itself was negative. A lymph node was removed for histologic examination and was reported to show "malignant lymphoma." A reexamination of the slide shows the characteristic picture of Hodgkin's disease, except that eosinophiles are entirely lacking. She entered the hospital four times for this complaint and was given x-ray treatment on each occasion with considerable relief. Two years and a half before her fifth and last admission she entered for the third time complaining of severe abdominal pain localized particularly in the left upper quadrant, and shooting pains down her legs. The abdominal pain was fairly severe at times and was investigated in the hospital. An x-ray showed some supposed involvement of the second lumbar vertebra. Lumbar puncture was negative and a barium enema was negative. She had had intermittent attacks of diarrhea which were not very severe up to that time. Thereafter the attacks of diarrhea became slightly more severe. Two months before her fifth admission she was in the Skin Ward for supposed lymphomatous involvement of her skin. Following that discharge, about a month before her last admission, she became rapidly worse, lost weight, and had more severe diarrhea, averaging fifteen or sixteen movements a day. Two weeks before the final admission she developed the old pain, only much more severe. The diarrhea continued until she came into the Emergency Ward.

Fifth admission She was given two x-ray treatments in the Emergency Ward. After four days the pain was not relieved. The diarrhea ceased and she developed diffuse abdominal pain. Her belly became very tense and she was so weak that she was advised to enter the hospital on the Medical Service.

*Recently senior interne on the East Medical Service.

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THE COMMON COLD

PERHAPS there are few ailments about which so much ignorance and obstinacy are exhibited by the public, and occasionally by some of the profession, as about the common cold. Being the most frequent and familiar of all diseases, it generally breeds an unwholesome contempt, instead of the wholesome respect which it deserves. Research has thus far contributed little to its control, beyond those precepts which should be the guide of practical medicine in treating its morbidity and avoiding its complications.

The term common cold, like most popular pathologic terms, is of course a misnomer, significant only in suggesting one of the predisposing causes of respiratory infection. As the youngest and therefore the least perfected of our body systems, the respiratory tract has the lowest resistance to infection. Any infection beginning in any part of the respiratory system is like a lighted match tossed into a field of dry grass and underbrush: the match may go out, or the fire may burn over the entire field, or,

by lucky turns of the wind, may spare certain parts of it. In any event, the fire is not extinct, until it definitely ceases even to smoulder.

We commonly assume that bacterial infection is the immediate primary etiologic cause of colds. Nevertheless, it is clear that predisposing secondary causes are almost invariably concerned, and of these probably the most important are fatigue and exposure to cold and wet. The peaks of seasonal incidence of colds in September and March, at times when the most marked climatic temperature adjustments are taking place, suggest that there may be a vasomotor element in many colds, as in the asthmas.

If an individual's general hygiene is good, we should expect his resistance to respiratory infections to be high, yet this does not prove always to be the case. Nor does the biochemistry of body fluids and tissue reactions afford a complete answer to the questions of immunity, resistance, and susceptibility. Alkalis do not necessarily cure a cold, nor does systemic hyperacidity necessarily lead to one. Indeed there seems sometimes to be a mutual exclusiveness between infections. A patient with periodic attacks of duodenal ulcer, was immune to colds when his ulcer was active, and susceptible when it was quiescent. Perhaps we misinterpret the relation of acidity to susceptibility, acidity may be rather the result or attendant circumstance of infection than its predisposing cause.

Moreover we are considerably in the dark about the infective agents associated with colds. We name a number of common organisms, and speak of the varying virulence of the same organism in different cases, but we know nothing of the cause of this variation, or of the strikingly different clinical phenomena which the same organism produces in different epidemics. While many colds are clearly transmitted between individuals, it may be questioned whether others are not due to focal infections within the individual or perhaps to unknown filterable viruses.

The occasional recurrence of colds, of minor severity and promptly recovered from, may be of advantage to civilized man, in that these recurrences may by automoculation serve to maintain a degree of immunity. Unfortunately this immunity, like that conferred by inoculation with so called bacterial vaccines, is generally of uncertain efficacy and of relatively brief duration. Not until we have methods as dependable as those employed in preventing diphtheria, typhoid and variola can we hope to control the common cold by artificial immunization.

"Doctor," says the patient with a bad cold, "is it the flu?" There is no such thing as the flu or the grip, they are only popular misnomers, measures of the severity of an infection, not of its cause. The term influenza should properly be applied only to an infection with the influenza bacillus. As a matter of fact, such in-

bones or the femora, but we did not find anything in the vertebrae

The first slide is from the liver. A large proportion, in fact well over fifty per cent of the liver tissue in this area has been replaced by a tumor mass which is moderately scirrhous in character, containing a quantity of dense connective tissue stroma. It is made up almost wholly of cells of the lymphocyte series, a considerable number of them multinucleated. There are no eosinophiles. On the whole the lesion is fairly characteristic of Hodgkin's disease.

The spleen showed similar lesions. The kidney showed, besides the abscess, a single nodule which in gross we failed to distinguish from the liver and spleen nodules but which microscopically turned out not to be lymphoma at all but a small leiomyoma.

A PHYSICIAN: Can you make any guesses as to whether this was a retrograde pyelitis or blood borne?

DR MALLORY: The pelvis and ureters were entirely negative, so that I think there is no question but it was blood borne infection.

DR HAMPTON: Did you find scars in the lung where we thought the Hodgkin's disappeared?

DR MALLORY: No, we did not make any special investigation, however. I think there is no question but that you got rid of the tumor.

A PHYSICIAN: Did you find normal lymph nodes? Did you cut any of those?

DR MALLORY: We have not any sections from them.

A PHYSICIAN: I wondered whether they showed normal architecture or not.

DR HOLMES: She did not have a high fixed diaphragm at any time, did she?

DR HAMPTON: I do not know, I think not. The right diaphragm is higher than the left. I think she had a large liver and a large spleen, in fact both diaphragms were elevated. Her last examination was six weeks before death.

DR MALLORY: I think it probably had been there over six weeks, I would guess much nearer six months, although in a patient with lymphoma and a large spleen pain in the abdomen would hardly make one think of the kidney, left upper quadrant pain being so common with lymphomatous involvement of the spleen.

In this case one of the presenting symptoms from beginning to end was diarrhea. We found absolutely nothing to explain that.

of Service, Urological Department, Massachusetts General Hospital Assistant Professor of Genito-Urinary Surgery, Harvard Medical School His subject is "Experiences with Prostatic Resection" Page 349 Address 87 Marlboro Street, Boston

GRAVES, ROGER C. A.B., M.D. Syracuse University College of Medicine 1918 F.A.C.S. Urologist to the Carney Hospital Genito-Urinary Surgeon to the Pondville Hospital Member of Staff of the Deaconess Hospital, and Associate Staff of the Palmer Memorial Hospital, Consultant to the Genito-Urinary Department (Tumor Clinic) of the Boston Dispensary, Consulting Urologist to the Quincy Hospital, the Lakeville State Sanatorium and the Winchester Hospital Associate Consulting Urologist to the Brockton Hospital His subject is "Transurethral Resection of the Prostate" Page 351 Address 12 Bay State Road, Boston

O'BRIEN, EDWARD J. M.D. Tufts College Medical School 1912 Visiting Urologist, St. Elizabeth's Hospital Visiting Surgeon, Cambridge Municipal Hospital Consulting Urologist, Somerville Hospital His subject is "Observations in Transurethral Prostatic Resections" Page 354 Address 270 Commonwealth Avenue, Boston.

HICKS, JAMES B. B.S., M.D. Johns Hopkins University School of Medicine 1924 Urologist for the Lahey Clinic His subject is "Prostatic Resection at the Lahey Clinic" Page 358 Address 605 Commonwealth Avenue, Boston.

EMERSON, ERNEST B. M.D. Harvard University Medical School 1898 Superintendent, Rutland State Sanatorium His subject is "Broncho-Pulmonary Suppuration" Page 365 Address Rutland, Massachusetts

GOODALE, RAYMOND H. B.S., M.D. Harvard University Medical School 1924 Pathologist, Worcester City Hospital, Harrington Hospital (Southbridge, Mass.), Fairlawn Hospital (Worcester, Mass.), Baldwinville Hospital Cottages, Baldwinville, Mass. Lecturer on Parasitology, Boston University School of Medicine His subject is "Enterobius Vermicularis of the Appendix." Page 372 Address City Hospital, Worcester, Mass.

OBER, FRANK R. M.D. Tufts College Medical School 1905 Assistant Dean, Courses for Graduates and Clinical Professor of Orthopedic Surgery, Harvard Medical School Surgeon-in-Chief, Orthopedic Department, Children's Hospital, Boston and the New England Peabody Home for Crippled Children His subject is "General Aspects of Chronic Arthritis" Page 374 Address 234 Marlboro Street, Boston

LE ROY CRUMMER (1872-1934)

THE death of Dr. Le Roy Crummer of Omaha, Nebraska, which occurred in Los Angeles, January 2nd of this year, removes from the field of medicine and medical history a figure of importance. A paternal ancestor, who came from the northern part of Ireland and was a strict Protestant, emigrated to America in 1819, first going to Delaware and later moving into the West, about 1835. He was an artisan, who worked in the mills as a blacksmith and mechanic. His son, John Crummer (1816-1890),¹ born in Ireland, prepared himself, without any schooling, for the Methodist Episcopal church and started as a circuit preacher in 1836, through the states of Illinois and Wisconsin. He went from place to place holding meetings wherever he could find room and became one of the most popular men of his day in this pioneer locality. Many of his parishioners were extremely poor farmers and there is a story about him that he was once paid for his services in wheat. He carried this wheat by wagon to Chicago and sold it, in order to provide the necessities for his family. This energetic, strict but lovable character built the first church in Milwaukee in 1841. A few years later he had to give up his arduous duties on account of his health but in 1849, inspired by the gold rush to California, he worked his way across the country, in the spring of that year. Returning to Illinois in 1851, he started a farm and spent a good deal of his time as an itinerant preacher of the gospel. The name of the Reverend John Crummer became a household word in the cabins of Illinois and Wisconsin. From this pioneer stock of the best character came the subject of this biography.

Le Roy Crummer was born in Elizabeth, Illinois, April 15, 1872. His father, who was also a physician, Benjamin F. Crummer (1848-1907), later moved to Omaha, where he became an important figure in the medical world and one of the most successful practitioners of his time. The son, who was graduated by the University of Michigan in 1893 with a bachelor degree and M.D. from Northwestern University in 1896, became associated with his father in Omaha and an instructor in the University of Nebraska. In 1919, just after the war period, he was made professor of medicine, a position which he held until 1925, when he became emeritus. When his health began to fail from serious heart disease, he moved to Los Angeles, California, and there associated himself with the University of California and the University of Southern California as professor of medical history, a subject which was of the greatest possible interest to him. His death occurred January 2, 1934, after a long illness.

Crummer was greatly interested in cardiology and he found stimulation in this branch of medicine in his work during the World War

fections are sometimes quite mild, whereas the term is commonly applied to any severe cold, whatever its etiology. The severest so-called influenzas are usually due to a streptococcus.

"Doctor", says the patient, "aren't these colds unusually prevalent just now?" No, they are usually prevalent. From year to year we all forget the respiratory epidemics and endemics which invariably come and go with the seasonal variations with which they fluctuate. In winter there are always plenty of respiratory infections in the community, and past evils never seem so bad as those which are immediate.

Clinically, the common cold should be a self-limited disease and under favorable conditions of environment and hygiene the human organism should recover from it speedily and without the complications of otitis media, mastoiditis, sinusitis, meningitis, and pneumonia which are its great dangers. The trouble is that these favorable conditions are seldom created or permitted to prevail. There is one best and safest treatment for the common cold,—for any respiratory infection,—and that is to go to bed and stay there until it is well. Yet that is precisely what the vast majority of patients, be they laymen or doctors, will not or think they cannot do. Doubtless this treatment, universally applied, might seem to cause serious dislocation of human activities and enterprises, yet we may question whether in the long run it might not effect economy of health and life.

"Doctor", says the patient in a hollow voice, after he has kept about for a week with a severe cold, "is there any danger of pneumonia?" Danger? of course there is danger, not only now but from the first snuffle of every respiratory infection, just as the possibility of death lurks in every pin-prick, if the right kind of sepsis gets into it.

Probably if the human race persists on this planet a few more million years, the respiratory system which it has inherited only since the time of the first amphibians will improve by selective survival until it is as tough and resistant as the alimentary tract developed from the days of the earliest lamellibranchs. Only then may we hope that the common cold will become as uncommon as it is always undesirable and unwelcome.

THE FORD CAR AND THE REDUCTION OF MORTALITY OF GASTRIC CANCER

WHY not reduce the mortality of cancer of the stomach? Evidently it can be done, because the surgeons know how to operate and their mortality is only about 10 per cent. Even suppose they cannot cure the majority of cases, they certainly can relieve many and prolong the lives of others for several years in comparative comfort. In the old the growth of the cancer is

often slow and a mere gastro enterostomy will lengthen life and remove distress.

The real reason for slow progress in the treatment of gastric cancer is the late diagnosis. Even in 1932 Balfour found that the rate of operability was only 45 per cent, which was approximately the same as that of previous years at the Mayo Clinic. In our issue of January 11 it was brought out that at the Lahey Clinic the operability was approximately the same. And what is the cause of the late diagnosis? Balfour's first conclusion answers that. He writes as follows: "(1) roentgenology is the most important method of detecting early cancer of the stomach." Lahey and Jordan express the same opinion. "The salvation of patients with carcinoma of the stomach is in early diagnosis. Early diagnosis can be made only when x-ray examinations of the stomach are made upon evidence which is only suspicious, and it must be accepted that many will prove negative."

Granted roentgenograms are essential why don't we take them? Everyone knows the reason why a gastro-intestinal x-ray is avoided. It is because one wishes to save the patient money. And the remedy? Increase the number of x-rays, reduce the cost, and ask the originator of the Ford car how it can be done.

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THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

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BARNEY, J. DELLINGER. A.B., M.D. Harvard University Medical School 1904. F.A.C.S. Chief

obtain an idea of the worth of Crummer's collection.

Crummer's writings on medical history are, unfortunately, very few. He published in 1929 a manuscript by William Heberden entitled, "An Introduction to the Study of Physic."⁴ This manuscript, which he found in a London bookshop, had not previously been printed. In a pleasant prefatory essay to this book Crummer tells of his finding the manuscript and his investigations in regard to it. An interesting and valuable contribution to a method of historical research, it reflects the keen interest of the man in everything that came to him. He wanted not only to own the manuscript but to find its place in relation to the other works of Heberden and to explain its value as a contribution to modern medicine. This he did in his own particular style in an essay which shows the breadth and depth of the man perhaps better than almost anything else that he wrote.

Another aspect of the history of medicine, which will always be associated with Crummer's name, is his work on early anatomical fugitive sheets. His collection, which was certainly unrivaled in this country, contained many rare items. He made an effort to check all the known fugitive sheets and this list was published in the *Annals of Medical History* in 1923⁵, followed by additional notes in the same journal in 1925. Some of the more important plates were reproduced in these papers. The sheets were arranged in five classes, as follows: 1, the skeleton sheets, 2, the *Tabulae* of Vesalius and its imitations, 3, the Adam and Eve plates, 4, the female figure alone, and, 5, the male figure alone. Many residents of Boston will remember with great pleasure his informal talk on this subject at the Harvard Medical Society, April 3, 1923. Photostat reproductions of these rare sheets were presented by Crummer to the Boston Medical Library. Other studies, all started by the acquisition of some rare item, were published from time to time, but his failing health made extensive work impossible and, unfortunately, only a few of his notes found their way into print.⁶ He became an associate editor of the *Annals of Medical History* in 1927.

Crummer's interest in medical history was constantly stimulated by his association with the John Crerar Library in Chicago. It was there that he first made a definite contact with medical books of importance, particularly the series of anatomical texts. His magnificent copy of Vesalius, first seen in this library, was purchased by him about 1920 and this led him into the wide field of medical bibliography. He was stimulated also by his close association in Omaha with Dr. Irving S. Cutter and Dr. Alfred G. Brown. Another friend, long associated with him, for whom Crummer had the greatest admiration, writes as follows: "He

had a decided *ingenium* for quickly perceiving essential facts and important traits in any field. His success as a diagnostician long ago had become assured. He had a peculiar light and almost whimsical method in anything he undertook, almost as if he were playing with his work, but this was only a manner by which he tried to conceal a certain diffidence which he never quite overcame. He was no scholar, nor did he pretend scholarship, but he had the peculiar American knack of penetrating directly into the core of any subject close to his sympathy, and using his native ability in an inductive way as he went along. I imagine that the direct and independent spirit of Vesalius appealed strongly to him, at any rate, he made himself master of Vesalian anatomy before very long, even to the bibliographical details and the historical and biographical side-lights open to the student. He analyzed his copy of the book—the finest which either he or I had ever seen—and presently found inserted in it a curious plate with flaps, which at the time he could not identify or connect with the book.

"This was followed by a thorough study of Mortimer Frank's expanded edition of Choulant, and a swift yet searching survey of the whole field of medical history, with visits to important collections and a study of copies of such books as he rapidly began to acquire. Almost by intuition he was led to take an interest in the fugitive sheets of medical illustration, his study being fed by the almost miraculous acquisition of about a dozen of these rare pieces bound together, some until then undescribed. The plate which he had found in his Vesalius proved another example. Dr. Crummer then made a careful bibliographical survey of this form of illustration, without neglecting his study of the general field, and then began his visits to European scholars, museums, libraries, and antiquarian booksellers, in search of material to satisfy his rapidly growing collective energy.

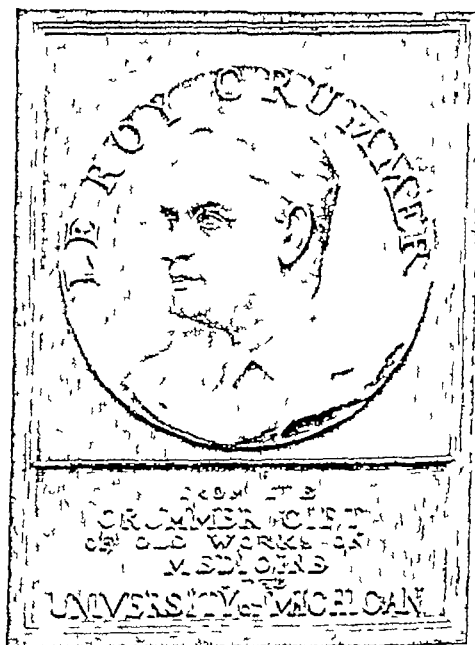
"Crummer was fortunate enough to obtain the more important part of his great collection before early and historically valuable medical books became an object of international speculation. The rapidity with which he acquired the knowledge requisite for discussing historical and bibliographic problems with such men as Garrison, Packard, Cushing, Klebs, Welch, et al., or with De Lint, Sudhoff, and many others, in Europe, was very remarkable. I am somewhat familiar with the researches which were recorded in the mimeographed catalogue of a portion of his library distributed some years ago—much being tentative and unhappily left unfinished by his illness, but some of them being of permanent bibliographical value. His talent of combining facts in historical medicine quite equalled his anticipation of some seemingly remote factors influencing the physiological

In spite of his well-known disability, he entered the Army in 1917, but was refused overseas duty. He did, however, go to Fort Oglethorpe in Georgia, where he became an instructor in cardiology for medical officers. He was a popular teacher and much admired by his associates and the students who gathered around him. As the result of this work, he wrote a book on heart disease, published in 1925.² As a basis for this volume he used Circular No. 21 from the Office of the Surgeon General, issued in 1917, a copy of which he published as an appendix to his book. This important Army order was compiled with great care and proved to be an exceptionally valuable medical contribution from the War Department. Crummer's volume, in general, was somewhat revolutionary in type and brought out his distinct individualism, for which he was well known. It was based, however, on long personal experience and many of the points that he made have later been confirmed by other workers. Far from a routine textbook, it caused considerable discussion at the time it was issued. He probably knew European clinics and their work on the heart better than anyone in this country and this knowledge plus his long contact with patients formed the basis for a practical and useful book, perhaps with greater significance than many critics realized at the time of its publication.

It is, however, with his career as a student of medical history and a collector of books that this short biography is particularly concerned. Crummer's father was broadminded enough to see that his son, as a young man studying medicine, was thoroughly educated not only in the classics but in modern languages. He could read both Greek and Latin and spoke French, Italian and German. Many visits to Europe during the summer vacations stimulated his interest in the older aspects of medicine and he began to collect a few books about the time he went into practice with his father. After his father's death in 1907, he was able to visit Europe even more frequently. His library grew slowly, however, and it was not until after the war period that he began to collect books assiduously. In this he was greatly helped by his wife, an authority on Elizabethan literature. They, naturally, had many interests in common and spent a good deal of their time in the decade from 1920 to 1930 traveling through Europe buying books and manuscripts. At one time they spent nearly a whole year touring through Italy with three matchless companions: an Italian nobleman, a learned priest, and an antiquarian bookseller. All the small libraries and bookshops in Italy were investigated and the Crummers bought many choice items for their own collection. He, also, at the same time, made purchases for the library of the University of Nebraska.

His personal library had grown to such an

extent that on April 15, 1927, Crummer's fifty-fifth birthday, Mrs. Crummer was able to present to her husband a printed catalogue of the books which he owned, issued before 1640.³ Only one hundred copies were issued. This was an expansion of a similar catalogue published in 1925, circulated in multigraph form. The catalogue of 1927 lists four hundred and forty-two manuscripts and books, most of which have now been deposited in the library of the University of Michigan. Each is to carry the book plate reproduced in this paper. Crummer's



Book plate for the Crummer Collection now in the Library of the University of Michigan Ann Arbor

library, although comparatively small, contains some very choice items. Naturally, the corner stones of medical history are represented in a very fine copy of the *Fabrica* of Vesalius (1543) and Harvey's *de Motu Cordis* (1628). His interest in anatomy led him to collect books printed before the time of Vesalius' work as well as those that followed directly after 1543. Although not by any means complete, there are important books in this collection of anatomical texts which serve as a basis for the understanding of the developing knowledge of anatomy during the sixteenth century. In addition to these anatomical works, of particular importance are a fine copy of the rare work by Ambroise Paré, *Anatomie Universelle du Corps humain*, the publication of Fracastoro on syphilis (first edition, 1530), rare editions of Alexis of Piedmont, many issues of the poem, *Regimen Sanitatis*, from the School of Salerno, and books by Ryff, Von Hutten, and many others. The catalogue, unfortunately, shows evidence of hurried compilation and many minor errors crept into it. Nevertheless, from it we can

Hugh Frederick Hare, 250 Clark Street, Brookline Mass
Richard Francis Welch 1212 Commonwealth Ave., Allston, Mass.
Charles Merton Holmes, 57 Waltham Street, Lexington, Mass
Harry Abraham Baker, 84 Third Street, Turners Falls, Mass
Lionel Cohen, Isolation Hospital, Springfield, Mass
Walter L. McClintock, Mercy Hospital, Springfield, Mass
Moses Ralph Kaufman McLean Hospital, Waverley Mass.
Frederick Albert Dunham, Walpole Mass
Donald Wieting MacCollum, Children's Hospital, Boston Mass
Harvey McLean Williams Aberdeen, Miss
Frank Jesse Otis, National Guard Hangar East Boston, Mass
Alan Matheson Poole, 204 High Street, Fall River Mass
William Curry Moloney, 31 Townsend Street, Roxbury Mass
Theodore Dodge Clark, Wolfeboro, New Hampshire
Joseph Raymond Hobbs 6 Summit Road Wellesley, Mass.
Philip Frederick Fortin, St. Luke's Hospital, New Bedford, Mass.
Benjamin R. Tilden St. Luke's Hospital, New Bedford Mass
Robert Joseph Donovan, 81 Johnswood Road, Roslindale, Mass
Samuel Herschel Proger, 14 James Street, Brookline Mass
Augustine William Eddy, St. Joseph's Hospital, Providence, R. I.
Samuel Willard Hartwell 21 Calbourne Street, Worcester, Mass
John Crago Lester Great Barrington, Massachusetts

July 11, 1933

Benjamin Lowenberg, 12 Lorraine Terrace, Brookline, Mass.
Samuel Busch Wurtzel, 406 Massachusetts Ave., Boston, Mass.
Elizabeth Rowbotham, 475 Columbia Road, Dorchester Mass
Louis Mastrangelo 35 Cooper Street, Boston Mass
Samuel Golden Beth Israel Hospital, W 16th and Lowell Blvd Denver Colorado
Alexander Kotarski, 242 Lynnfield Street, Peabody Mass
Merton Warren Miller, 108 Newtonville Ave., Newton Mass
John Anthony Koreywo Hahnemann Hospital, Worcester Mass
Emma Ruby Ardis West Auburn Mass
Mark Shachov 8 Feneno Terrace Brookline Mass
Jackson Nash Thomas McLean Hospital Waverley, Mass
Robert Cooper Byrne Hatfield, Mass
Louis Levine 29 Walnut Street, Chelsea Mass.

Leroy Sargent Ford, 8 Danville Street, West Roxbury, Mass.
Joseph Christopher Flynn, Cambridge City Hospital, Cambridge, Mass
Gavlord Palmer Coon, Foxborough State Hospital, Foxborough, Mass
Daniel Francis Gallery, 682 Second Street, Fall River, Mass
Wendell Chamberlain Matthews, 15 East Street, Franklin, Mass
Samuel Sonna Levinson, 56 Stedman Street, Brookline Mass
Edward Brendan French, St. Joseph's Hospital, Lowell, Mass
Kenneth James Chadwell, 22 Ashland Street, Lynn, Mass
George William Lynch, 9 Arlington Road, Woburn, Mass
Robert Mannix Holland, 105 Newburg Street, Roslindale, Mass
Edward Meyer Nathan, 74 Independence Ave., Quincy, Mass
Francis Joseph McNamara, 478 Lebanon Street, Melrose, Mass
Newell Stephen Hagan, 40 Park Avenue, Revere, Mass.
Anna Heard Maxwell, N Reading State Sanatorium, N Wilmington Mass
Cuthbert Ewart Claude Phillibert, 222 Walnut Avenue, Roxbury, Mass
Max Ginsberg 29 Crawford Street, Roxbury, Mass.
Alfred Hurwitz, 321 Summit Avenue Brighton, Mass
Albert Edward Sloane, 300 Washington Ave., Chelsea, Mass
James Israel Holoff 179 Callender Street, Dorchester Mass
Harry Herbert Shapiro 482 Norfolk Street, Dorchester Mass
Monica Allen Harnden, 128 Bellevue Street, West Roxbury, Mass
Frank Travers 8 Fulton Street, Worcester, Mass
Robert Earle Glendy, Middlesex Co Sanatorium, Waltham, Mass
Werner Mueller, 14 Dunster Road Jamaica Plain Mass.
Charles Anthony Contino 96 Train Street, Dorchester, Mass
Boris Benjamin Rubenstein, 4 Dennison Street, Boston Mass
Raymond William Gadbois St. Vincent's Hospital Worcester Mass
James Vincent McHugh 39 Grand Street Leominster, Mass
LeRoy Jakway Osborne, 1533 N 33rd Street, Philadelphia Pa
Richard Levi Blaisdell Wingate 10 Sanborn Terrace Amesbury Mass
John Joseph Decker Lakeville State Sanatorium, Middleboro Mass
Lionel Mortimer Ives McLean Hospital Belmont, Mass

status of the heart. He was a quick man, one of a few that I would call brilliant, with that enlightenment of spirit and mind to which a plodding scholarship is subservient

"He married late, but happily, and at a time when the enthusiasm and the bibliographical help which his wife could give, came to mean much to him. Neither of the two could have supported an academic study of the history of medicine, neither would take the place of an Osler, but together they found what they wanted, recognized its importance as by instinct, and secured it for their library. They also recognized the value of an organized search for material related to what they already possessed, and their repeated visits in Europe resulted in finds that probably never will be equaled in importance by any one collector, even though they knew quite well that in later years, when they were known by every dealer of note, preparations were made for their reception, rarities adduced, recesses diligently searched

"A collecting energy as fruitful as was that of Dr and Mrs Crummer does not depend entirely upon 'luck'. Every collector in any field has some luck. In this case the felicitous result was due to an instinctive feeling for essential values, dependent upon a fundamental sense of valid authentic source material. One may be born with this feeling, but the specific sense is acquired only by the penetration of subjects, fields of research, organic groups of material, by means of an intelligent estimate of that which is centrally significant—in contradistinction to what merely may be peripheral and intermediate."

To this delightful and penetrating summary of Crummer one can add little. The books, after all, are his monument and they, fortunately, find a final resting place in his old college library, where he wished them to be. They are worthy of a high position in American medicine as the man was worthy of his strong and steadfast family inheritance.

H R V

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 - 2 Crummer Le Roy Clinical Features of Heart Disease Introduction by Emanuel Libman. New York Paul B Hoeber 1935
 - 3 A Catalogue Manuscripts and Medical Books Printed Before 1640 In the Library of Le Roy Crummer Omaha, Nebraska Privately Printed at Omaha, April 15 1927
 - 4 Heberden William An Introduction to the Study of Physic. Prefatory Essay by Le Roy Crummer With a Reprint of Heberden's Some Account of a Disorder of the Breast. New York Paul B Hoeber 1929
 - 5 Early Anatomical Fugitive Sheets Annals of Med. Hist 6 189 209 1923 also Further Information on Early Anatomical Fugitive Sheets. Ibid 7 15 1925
 - 6 Laennec. Nebraska State Med Jour 4 315 1919 Cophos Anatomia Ford Annals of Med Hist 9 150-182 1927 Copy of Jenner Note Book. Ibid. N S 1 403-428 1929 An Original Drawing of the Title Page of Vesalius Fabrica. Ibid N S 2 20 30 1930
- * Mr J Christian Bay Librarian of the John Crerar Library

PHYSICIANS' ART SOCIETY OF BOSTON

In December, 1927 there was held at the Boston Medical Library a very successful Exhibition of Works of Art by New England Physicians

Since then there has been considerable interest shown for another exhibition and it is now proposed to hold one at the Library in April

In connection with this exhibition, it has been suggested that a Physicians' Art Society be formed for the purpose of holding annual exhibits and to foster arts and crafts among members of the medical profession

Members of the Massachusetts Medical Society, Massachusetts Homeopathic Society, Massachusetts Dental Society and allied organizations are eligible for membership in the proposed Society

A meeting for the purposes of discussion and organization will be held at the Boston Medical Library on Friday, February 23rd at 4 30 o'clock in the afternoon

All physicians and dentists who are interested in either creative or applied art are invited to attend this meeting and also to send their names and the names of their friends interested in Art to James F Ballard at the Boston Medical Library, 8 The Fenway, Boston

MISCELLANY

PHYSICIANS REGISTERED BY EXAMINATIONS
HELD MAY AND JULY, 1933

THE COMMONWEALTH OF MASSACHUSETTS
BOARD OF REGISTRATION IN MEDICINE

May 25, 1933

Glen Vaughan Butler, 8 Dana Street, Cambridge, Mass

Charles Raymond Watts, 429 Farmington Ave, Hartford Conn

Herbert Nicolo Gerardell 107 University Road, Brookline, Mass

Frank Durante, 49 Waverley Street, Everett, Mass

Pearl Goodman, 135 Main Street, Nashua, N H

Louise Hinchliffe, 70 Fenway, Boston, Mass

Dorothy H Cheney, Mass Memorial Hospitals, Boston, Mass

Angelo L Maletta, 42 Bow Street, Medford Mass

Willis Merritt Monroe 76 Taylor Street Pittsfield, Mass

Raphael Peter Fox, 76 Prairie Ave, Auburndale, Mass

Henry Francis Larchez, 147 Wildwood Ave, Arlington, Mass

Samuel Solomon, 603 Washington St. Quincy, Mass

Adelard Alexander Demers, 31 South Street, Fall River, Mass

Yacoub Toros Touzjian, 359 Broad Street, Providence, R. I.

Marshall Nairne Fulton, Peter Bent Brigham Hospital, Boston, Mass
Merrill Frank Gardner, South Dartmouth, Mass
Alden Batchelder George 397 Main Street, Haverhill, Mass
Samuel Gilman, 246 Highland Ave., Somerville, Mass
Max Martin Goldstein, 37 Aspinwall Road, Dorchester, Mass
William Frederick Green, 72 Peterborough Street, Boston, Mass
Sven Martin Gundersen, 368 Walnut Street, Brookline Mass
James Addison Halsted, 264 Beacon Street, Boston, Mass.
Earle Allaway Harvey, 18 Garland Street, Melrose, Mass
Mildred Johanna Hausman, Hospital Cottages for Children, Baldwinville, Mass
Wright Platt Hewitt, 7 Wayland Street, Wollaston, Mass.
Henry Forbush Howe, 231 Beacon Street, Boston, Mass
Edward Reed Hubbard, 157 High Street, Taunton, Mass
Salvador Jacobs, 461 Dudley Street, Roxbury, Mass
Karekan Alexander Kazanjian, 22 Dartmouth Street, Watertown, Mass
George Robert Lavine, 2 Eastland Ave, Brighton, New York.

The Massachusetts Medical Society

AN APPEAL FOR SUGGESTIONS

February 7, 1934

To the Editor,
New England Journal of Medicine,

May I, as Chairman of the Committee appointed by the Council of the Massachusetts Medical Society, to revise the By Laws of the Society, have the privilege of asking any member of the Society at large who is interested in the By Laws and who has any suggestion as to changes therein, to send such suggestions in writing to me at the Peter Bent Brigham Hospital Boston, at his earliest convenience in order that the Committee may have every aid in preparing a draft which will be satisfactory to the Council. From what I learned today at the meeting of the Council and at the Cotting Luncheon it was evident to me that many members of the Council had not found opportunity to read the report of the Committee on Revision which was printed on the inside cover of the draft and presumably therefore had not scrutinized the revision itself. It is essential that the Committee shall have the aid of every interested member of the Society

Thanking you for displaying this request in your columns, believe me

Yours very truly,

DAVID CHEEVER, M.D., *Chairman,*
Committee on Revision of the By Laws

CORRESPONDENCE

PAYMENT FOR ANTIRABIC VACCINE

THE COMMONWEALTH OF MASSACHUSETTS
Department of Public Health

State House, Boston,
February 1, 1934

Editor, *New England Journal of Medicine*

Owing to an unfortunate experience which one physician in the State has had regarding payment for antirabic vaccine used by him, may I take this occasion to call to the attention of other physicians the proper procedure in such cases

Under Chapter 289 of the Acts of 1932 it is provided that 'the board of health of any city or town shall, on recommendation of the state department of public health furnish free of charge antirabic vaccine for the treatment of persons as to whom said department recommends such treatment, ' In accordance with the authority given to the Department by this section, the Department has notified all boards of health that it would recommend treatment under the following circumstances

1 *Treatment imperative*

Persons bitten by or intimately exposed to the saliva of

- a A clinically rabid animal
- b An animal the head of which was found positive for rabies on laboratory examination
- c An animal the head of which was found suspicious for rabies on laboratory examination

2 *Treatment advised unless the circumstances surrounding the bite are such that in the opinion of the attending physician there is no possibility of rabies in the individual case*

- Persons bitten by or intimately exposed to the saliva of
- a An animal the head of which was in such condition on reaching the laboratory that it could not be examined and was therefore classified as unsatisfactory
 - b A lost animal, that is an animal which could not be restrained for a clinical observation period of fourteen days or the head of which could not be submitted for laboratory examination
 - c. An animal which was killed without being held for examination and without subsequent examination of the head

In the case in question the physician proceeded to buy the vaccine, believing that the local board of health would reimburse him for the cost of the same. On the other hand the local board of health can in many instances obtain a substantial discount from the drug company producing the vaccine. Consequently, the board of health cannot be expected to pay a bill which is greater than would have been the case had the physician obtained the vaccine through the

Mary Elizabeth Bolger, 21 Washburn Street, Worcester, Mass
 Albert Francis Gingras, Providence Hospital Holyoke, Mass
 Solomon Louis Prumson, 30 Allen Street, Boston, Mass.
 Henry Edward Donalds, 64 Ferry Street, Easthampton, Mass.
 Eliot Wolk, 74 Bernard Street, Dorchester, Mass
 Paul Peter Montag, 73 Essex Street, Chelsea, Mass
 Christopher Edward Egan, 23 Dale Ave., Gloucester, Mass.
 John Samuel Kelley, 9 Parkwood Terrace, Jamaica Plain, Mass
 Edmund Reeves Mitiguy, 39 Walnut Avenue, Norwood, Mass
 Samuel Fox, 82 Kingston Street, Lawrence, Mass
 Charles Augustine Higgins, 42 Tewksbury Street, Lawrence, Mass
 Frank Bryant Sauter, 1 Ball Street, Worcester, Mass
 Rose Marie Zoretskie, 740 S Crouse Ave., Syracuse, New York.
 Rudolph Emil Swenson, 19 Warren Avenue, Plymouth, Mass
 Harry Levin, 815 Broadway, Everett, Mass
 Clarence Dunbar Hart, 37 Charnwood Road, W Somerville, Mass
 Jacob John Arenstam, 399 East Street, Pittsfield, Mass
 James Otto Walls, Ayer, Mass
 Leon H Cohen, 2281 Milton Ave., Solvay, New York.
 Joseph Henry Marks, Truesdale Memorial Hospital, Fall River, Mass
 Olive Gates, 992 Beacon Street, Newton Centre, Mass
 Alfred Milton Kronberger, 9 Chapin Road, Newton Centre, Mass
 Robert Henry Baker, Sassaquin Sanatorium, New Bedford, Mass
 Francis David Rohan, 43 West Dedham Street, Boston, Mass
 Winifred Elizabeth Shaffer, Cove Landing, Hudson, Mass

LIST OF REGISTRANTS BETWEEN MAY 13, 1933 AND
JULY 11, 1933

Alfred Oscar Ludwig, Mass General Hospital, Boston, Mass
 Timothy Francis Patrick Lyons, 161 West Canton Street, Boston, Mass
 George Aaron Marks, 198 Commonwealth Avenue, Boston, Mass
 John Anthony Maroney, City Hospital, Worcester, Mass
 Marjorie Clara Meehan, 368 Longwood Avenue, Boston, Mass
 Joseph Albert Menousek, 78 Shurtle Meadow Ave., New Britain, Conn
 Dorothea May Moore, 101 East 74th Street, New York City
 Wallace Joseph Nichols, 20 Otis Street, Medford, Mass
 Randolph Piper, 20 Clarke Street, Lexington, Mass

Norman Anthony Pokorny, 1862 North 73rd Street, Wauwatosa, Wis
 Henry Nickerson Pratt, Children's Hospital, Boston, Mass
 George William Rafferty, Boston City Hospital, Boston, Mass
 William Page Reed, 24 Griggs Terrace, Brookline, Mass
 John Robert Richardson, 1 Goodwin Place, Boston, Mass
 Benjamin Riseman, 15 Maybrook Street, Dorchester, Mass
 Marjorie Clarissa Roach, Vassar College, Poughkeepsie, N Y
 Marian Wilkins Ropes, 18 Felt Street, Salem, Mass
 Leonard Bernard Rosen, 312 Essex Street, Salem, Mass
 Philip Earl Sartwell, Evans Memorial, Boston, Mass
 Morris Louis Sharp, 12 Canterbury Street, Dorchester, Mass
 Charles Ga'e Shedd, Boston City Hospital, Boston, Mass
 Donald Johnson Simons, 74 Fenwood Road, Boston, Mass
 Clement Andrew Smith, 4 Hawthorne Road, Brookline, Mass
 Somers Hayes Sturgis, 3 Pinckney Street, Boston, Mass
 Harold Morrison Teel, Boston Lying-in Hospital, Boston, Mass
 Edward George Thorp, 196 Huntington Ave., Boston, Mass.
 Leslie Howard VanRaalte, 587 Hancock Street, Wollaston, Mass
 Benjamin Smith Wood, 755 Main Street, Waltham, Mass
 Mitchell John Zadrozny, City Hospital, Worcester, Mass

NATIONAL BOARD DIPLOMATES

LIST OF REGISTRANTS FROM MAY 13, 1933,
TO OCTOBER 27, 1933

Taft Ameen Antoun, Memorial Hospital, Worcester, Mass
 Rudolf Friedhold Bachmann, Burbank Hospital, Fitchburg, Mass
 Walter Willard Boyd, 48 Mt. Vernon Street, Boston, Mass
 Morton Goodwin Brown, 1750 Commonwealth Ave., Brighton, Mass
 John Joseph Carroll, Jr., 17 John Street, Chelsea, Mass
 Milton Henry Clifford, 60 Montgomery Street, Bangor, Maine
 Richard Collins, Jr., 378 Beacon Street, Waltham, Mass
 William James Cosgriff, 10 Andrew Street, Springfield, Mass
 Arthur LeRoy Cramps, N E Sanitarium & Hospital, Stoneham, Mass
 John Archibald V Davies Farmington, Connecticut.
 Sidney Derow, 73 Thatcher Street Brookline Mass.
 Samuel Fomon, 409 Walnut Street, Appleton, Wis

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEL Fridays, 5 00 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House Boston

SPECIAL

From Friday, January 19, the State House Broadcasts were discontinued and in their place were substituted Ten Minute Health Reviews

Sponsored by the Massachusetts Department of Public Health Assisted by Miss Violette Babcock, Violinist, and Mr G Lambert Roscoe, Pianist and Organist.

Courtesy WEEL Fridays, 1 15 P.M.

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health Blended with Classical Music.

After you have heard this program, we would appreciate your comments

REPORTS AND NOTICES OF MEETINGS

DINNER TO DR. FREDERIC A. WASHBURN

The trustees of the Massachusetts General Hospital tendered a testimonial dinner to the retiring Director, Dr Frederic A. Washburn, at the Hotel Somerset on February 7. About four hundred guests were present. Mr William Endicott, chairman of the board, after enumerating the achievements of Dr Washburn during his directorship introduced the Right Reverend Henry K Sherrill Bishop of Massachusetts as toastmaster

Mayor Frederick W Mansfield the first speaker told of his good fortune in having secured the services of Dr Washburn as Institutions Commissioner of the City of Boston lauded the distinction which the guest of honor had attained as Director of the hospital and expressed his belief in the success which he expected would meet Dr Washburn's efforts in his new position

Mrs Nathaniel Thayer praised the work which the volunteer women were doing in this hospital and the support which they had always received from Dr Washburn. She also stressed the importance of the development of social service at the hospital the first of its kind in the world, started by Dr Richard C Cabot.

The other speakers were the Honorable Leverett Saltonstall Speaker of the House of Representatives the Right Reverend William Lawrence, who pointed out in particular the great good which Dr Washburn can do as Institutions Commissioner Dr Nathaniel Faxon, Superintendent of the Strong Memorial Hospital in Rochester, N Y., President of the

American Hospital Association, and formerly Assistant Director of the Massachusetts General Hospital, Dr David L Edsall Dean of the Medical School of Harvard University Dr James H Means, Chief of the Medical Service at the hospital, and Dr Washburn's adjutant during the World War, and Dr George H Bigelow, formerly Commissioner of Public Health of the Commonwealth of Massachusetts, and Dr Washburn's successor as Director of the hospital.

Telegrams of greeting were read from the Metropolitan Hospitals of New York, and the Fifth Avenue Hospital.

In reply Dr Washburn spoke feelingly of his years of association with the hospital, beginning with his service as House Pupil in 1896, and read the roll of honor of employees of all grades who had been long in the service of the institution.

HARVARD MEDICAL SOCIETY

The Harvard Medical Society met in the Peter Bent Brigham Hospital Amphitheatre, Tuesday Evening January 16 1934, at 8 15 P.M., with Dr Cecil Drinker presiding. The guest speaker, Dr W G Smillie, had as his subject "A Trip to the East Coast of Greenland."

The meeting opened with the presentation of cases Dr Harold Levine of the Medical Service gave the history of a twelve-year-old American boy who complained of frequent sore throats, over a period of two to three years. Eleven days ago, the patient noticed that his throat was sore and the glands swollen that he was feverish and had had sweats of one week's duration. Two days before admission, he appeared at the Out-Door Department with a story similar to that above. He was admitted to the house.

Physical examination revealed red and swollen tonsils, with purulent material in the crypts, a heart, normal in size with LBCD at the nipple line but with a first sound of variable intensity, a systolic murmur at the apex, an independent systolic murmur in the second left interspace and loudest over the third left interspace with a low pitched sound in diastole. blood pressure 145/55 and rate of 130.

Past history indicated that the patient had been in the Children's Hospital on several occasions for numerous sore throats. Each time the pulse was elevated to 130 but came down to 48 with the subsidence of the infection. When the patient was two years of age a pediatrician had found a systolic murmur maximal in the pulmonary area. The condition had been diagnosed as heart block due to congenital cardiac defect.

After a few days in the Peter Bent Brigham Hospital the temperature dropped and the pulse rate remained between 55 and 36. The EKG showed a complete dissociation of the auricles from the ventricles. The pulse was absolutely regular. The remainder of the physical examination continued

board In other words, a private individual cannot contract an indebtedness for the community

In view of the above and to avoid similar misunderstandings in other cases, I would suggest that, when ever a physician feels that an antirabic treatment is indicated, he communicate immediately with the board of health of the community in which the patient lives, or if the bite occurred in another community, in that in which the bite was sustained, and that the antirabic vaccine be obtained through the board of health in question. It is only in this manner that the vaccine may be obtained for the patient at the expense of the board of health

Very truly yours,

HENRY D CHADWICK, M D,
Commissioner of Public Health

RECENT DEATH

COFFIN—GEORGE HENRY COFFIN, M D, a retired physician whose home was at 52 Glen Street, Malden, Mass, died at the Glenside Sanatorium, Jamaica Plain, February 8, 1934, after a long illness

Dr Coffin was born in 1851 He was educated in the Newton schools and Brown University and graduated in medicine from the Boston University School of Medicine in 1903 Before studying medicine he was a teacher in private schools He practiced for twenty years in Northboro

He is survived by his widow, Mrs Jennie C (Guild) Coffin, a daughter and two sons

OBITUARY

DELBERT L JACKSON, M D

In these days of efficient and impersonal medicine, the passing of a physician who was also a friend to all his patients is worthy of record, though there is no danger that he will be forgotten by those who knew him and therefore loved him

Dr Jackson's outstanding characteristic was his cheerful and friendly attitude toward "all sorts and conditions of men" He had also an abundance of energy, a clear quick working mind and a fund of cheerfulness that carried his patients safely through hours of anxiety and sorrow, and supported him in equanimity to the end And finally he was possessed by an integrity of purpose which kept him always in the state of mind which Stevenson calls the most important task in life "friends with himself" Thus he carried on his practice Always busy, always keenly interested in all his patients, he carried to them cheer which he characteristically cloaked in preposterous and gaily impudent remarks and gave them, moreover, the highest type of skilled and wise treatment He had the manual dexterity characteristic of the New Englander, and that rare and mis-called quality 'common sense', a combination of utmost value to those who sought his help

Because of those qualities recognition came not rapidly or dramatically but steadily, surely, and

was prized by him not so much as a measure of professional and social advancement as an opportunity for increased service and a larger circle of friends. He was a Fellow of The College of Surgeons, The American Association of Obstetricians, Gynecologists and Abdominal Surgeons, The New England Obstetrical and Gynecological Society, The Boston Obstetrical Society (of which he was formerly president), The American Medical Association and the Massachusetts Medical Society His services as a consultant were increasingly sought, and he was a member of the consulting staff of the Choate Memorial Hospital in Woburn, The Framingham Union Hospital, The Jordan Hospital in Plymouth, and the Winthrop Community Hospital He was Associate Obstetrician at the Boston Lying in Hospital, Obstetrician and Trustee of the New England Baptist Hospital and a member of the Advisory Board of the Florence Crittenton League of Compassion

Just when these accumulating honors were convincing him of the affection and esteem in which his friends and associates held him, he was suddenly prostrated five years ago by a serious and painful disease of the heart. There was one sad hour as he realized fully what the attack meant, and then wasting no time on self pity, he summoned his great cheerfulness, endured without complaint months of enforced idleness, curtailed his activities, and once more, with undaunted cheeriness and unabated interest turned the page and started again, though he realized that the book might slam shut at any moment. For five years he accomplished the impossible, defying invalidism through the power of his happy spirit, and then when the end came, he met it resolutely, with a smile and a preposterous remark. His life is an example of the success that can come through self forgetfulness, equanimity, and love for one's neighbor

C H L

NOTICE

RADIO HEALTH MESSAGES

FEBRUARY MARCH, 1934

Sponsorship Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.

Courtesy WBZ Fridays, 4 30 P M
February

- 16 Stomach Trouble
- 23 Lumps in the Neck

March

- 2 Age and Cancer
- 9 Some Problems of Epilepsy
- 16 Fractures
- 23 How to Keep the Well Child Well
- 30 Résumé of the Year's Work

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health. Fridays 4 40 P M

disclosed purpuric spots on his skin, and the diagnosis was Henoch's purpura. The second and third cases were those of pneumonia and acute alcoholism simulating surgical conditions of the abdomen.

Dr. Elliott C. Cutler spoke on "Non Perforative Traumatic Lesions of the Abdomen." These may be caused by high fall, slow squeezing of the abdomen or blows. Several interesting case histories were cited as illustrating the various conditions included under this general heading. (1) A nineteen year old female patient was in an automobile accident after which she was able to walk about. She came to the hospital where the systolic blood pressure was found to be 90. There was crepitus at the eighth costosternal junction, the WBC was 19,000, the abdomen was board like. Morphine was given and on the following day the pulse, temperature and blood pressure were normal. On the third day the temperature rose and operation was advised. A lobe of the liver was found floating freely in the abdominal cavity and no evidence of peritonitis was disclosed. She made an uneventful recovery and Dr. Cutler emphasized how this refutes the opinion that bile in the peritoneal cavity causes a very serious form of peritonitis.

(2) A seventeen year old truck driver was in an accident after which he was found to have left shoulder pain when lying on his left side, and right shoulder pain when he shifted to the opposite side. There was no pain when he sat upright. Operation revealed a tear in the diaphragm.

(3) A football player was struck just below and to the right of the umbilicus after which he continued playing in the game. After four hours he began to vomit and at operation there was found a hematoma of the terminal ileum.

(4) While coasting a boy struck a telephone pole and went into shock. Laparotomy disclosed a tear in the fixed portion of the duodenum where it crosses the spinal column.

In concluding his remarks Dr. Cutler emphasized the importance of resetting the scene of the accident in making an accurate diagnosis.

In his discussion of these papers Dr. I. J. Walker spoke of two types of pancreatitis, first, the acute hemorrhagic type in which the onset is sudden followed by collapse and secondly, the suppurative type which begins with low grade epigastric pain and shows signs of low grade sepsis. One frequently sees hiccup and distention in this latter condition but shock is not present.

In rupture of the spleen one frequently finds signs of delayed hemorrhage and the patient will often show no evidences of shock until a day after the accident. Shifting dullness in the flanks, shoulder pain and a blood pressure lower than normal are common findings in this condition.

Dr. Walker classifies the acute gallbladder according to four divisions. (1) hydrops in which the gallbladder is filled with mucus but shows no infection. (2) the distended infected gallbladder which

is essentially an empyema, (3) a large thick walled red gallbladder with infection largely in the wall of the viscus represents a cellulitis and (4) the gangrenous gallbladder may be an accompaniment of any of the foregoing three conditions owing to a shutting off of the blood supply from overdistention or thrombosis of the vessels.

One should not hasten to operate upon the acute gallbladder for 56 per cent of them will quiet down. If infection is present it is a question of waiting or of operating and draining the viscus. If there is a steady rise in temperature and leucocytosis operation is indicated. There should be no fast rule for operation, but one should be guided by the history and subsequent course of the patient in the hospital.

In conclusion, Dr. Walker stated that the most important single decision in acute abdominal symptoms is deciding whether it is a surgical condition.

CARNEY HOSPITAL OUTPATIENT STAFF

At the regular monthly meeting held in January, the Out Patient Staff went on record as being opposed to all night clinics.

WM. F. COUGHLIN, M.D., Secretary

FAULKNER HOSPITAL CLINICAL MEETINGS

On Thursday afternoon, February 1st at 5:00 P.M. the regular monthly meeting of the Staff of the Faulkner Hospital was held at the hospital.

Two cases were presented which had come to autopsy during the month.

One was a case of bulbar palsy coming on in an individual in whom Parkinson's disease had existed for several years. The onset of Parkinson's disease followed an acute infection and the question was naturally raised whether the Parkinson's disease was a post-encephalitic syndrome. It was suggested that the bulbar palsy might have been a flareup of the encephalitis in a different area of the brain. None of those present had seen a Parkinson's disease terminate with the type of bulbar palsy which this case presented. At autopsy no cause for the bulbar palsy was determined. There was an area in the lenticular nucleus which would be consistent with the Parkinson's syndrome. Possibly minute histological study may show the cause of the bulbar palsy. Dr. Rooney called attention to the peculiar histological appearance of the liver which is such as is seen in certain types of starvation. This patient had lost considerable weight over a period of time and during the last days of his life he lost weight rapidly because of his inability to swallow.

The other patient was one that obviously had bronchopneumonia from the clinical picture. Auricular fibrillation was also present. The clinical course was characteristic of lobar pneumonia. The sputum had been thick and purulent without rusty color or blood. Organisms suggestive of the influenza bacillus were numerous. At autopsy there was more

negative The circulation rate by the sodium cyanide method was found to be fifteen seconds, and by the adrenalin method, nine seconds Exercise produced a slight increase in rate and adrenalin brought it up to between fifty and sixty X ray showed a normal sized heart, with a straight left border Results of laboratory studies were unimportant.

Dr Fitz, called upon for comment, pointed out that this patient with congenital heart block had yet developed normally There had been no subjective symptoms, no Stokes Adams attacks, no failure of the heart during the stress of athletic sports The future of the patient, according to Dr Fitz, appears to be perfectly good

Dr Wilson, of the Surgical Service, presented the second case, that of an Irish American chauffeur, 57 years of age whose chief complaint was a cough of six months' duration Past history was negative The present illness began last summer with the onset of cough, which came on only at night and lasted for one hour There was a moderately thick white sputum Four weeks ago, the cough became more severe and was diurnal as well as nocturnal He raised fifty to seventy cc of sputum daily this was blood flecked at times but never foul A few weeks ago he became hoarse There had been a five pound weight loss during the last six months

He was seen in the Out Door Department, where râles and slight increase in tactile fremitus and voice sounds were found in the right chest An x ray plate at this time showed a small area of consolidation in the right lung posterior to the hilus Results of laboratory procedures were negative

He remained on the Medical Service for one week, after which he was transferred to the Surgical Service While on the medical ward, his cough persisted and he raised small amounts of sputum, examination of which revealed a few short and long chained gram positive cocci His red blood cell count was 4.5 million while the white blood cell count varied between 8000 and 10,000 The differential count was normal

While on the Surgical Service, he was given on each of four occasions at few day intervals, 700 cc of air into the right pleural cavity By these measures one obtained a complete collapse of the lung

Dr Elliott Cutler in discussing the case said he felt the diagnosis to be that of a malignant lung tumor He further explained that part of the preparation for lobectomy consisted of a collapse of the involved lung He then asked Dr Merrill Sosman to describe the x ray findings According to Dr Sosman, diagnosis by x ray was doubtful The possibilities to be considered in this case were primary or secondary tumor or no tumor at all The lung shadow showed an area of decreased density in its upper part moreover it is of exactly the same type as he has seen in two other cases of adenocarcinoma of the lung Bronchiogenic carcinoma always starts at the root of the lung adenocarcinoma, on the contrary, may start anywhere in the

lung, usually, however, in the distal portions, thus offering the best chance for successful surgical intervention Dr Chamberlin, who is at present with Chevalier Jackson, saw this x ray picture with Dr Sosman, and believed it to represent a lung tumor He suggested, though, the possibility of Hodgkin's disease However, after seeing the patient and finding no evidence of itching of the skin or of enlarged glands, etc., he formulated a diagnosis of carcinoma of the lung

Dr W G Smillie described in an interesting manner, with the aid of slides and several reels of motion pictures, his trip to the East Coast of Greenland The purpose of the expedition, was the study of the fauna of the Arctic region, the geology and paleontology of the East Coast of Greenland, and in particular, the habits of the musk ox, with a view to preventing their extinction The journey was made in a ship specially built for cruising in the ice fields The rugged beauty of the Arctic landscape with its icebergs, glaciers, and quaint animal life, was vividly portrayed Dr Smillie kept up a running fire of anecdotes and fascinating comments throughout the showing of the films that kept the audience thoroughly amused and interested

HOUSE OFFICERS' ASSOCIATION OF THE BOSTON CITY HOSPITAL

On Monday evening, January 8, the House Officers' Association of the Boston City Hospital held a meeting devoted to a discussion of "The Acute Abdomen"

Dr William Reid Morrison began with a discussion of "Perforative Lesions of the Upper Abdomen" In his experience with perforation of peptic ulcers Dr Morrison enumerated the following facts (1) The ages have ranged from 14 to 76 and, of 75 of his cases operated on, only one was a female (2) More than 50 per cent have had no previous symptoms (3) One of the most important diagnostic signs is the demonstration of an air bubble between the liver and diaphragm by x ray plate and fluoroscopic examination This is best done with the patient in the standing position (4) Of importance in the differential diagnosis is the abdomen of acute alcoholism, which frequently gives a board like condition (5) Dr Morrison believes that the ulcer and induration should be excised and if closure leads to serious stricture of the pyloric opening a posterior gastro-enterostomy should be done (6) The post operative mortality in this condition in his hands is about 18 per cent

Dr Franklin D White spoke on 'The Medical Aspects of the Acute Abdomen' He emphasized certain important points in the history and physical examination of patients with acute abdominal symptoms, and cited the following case histories (1) A young man was suffering with pain in the right lower quadrant. He had some tenderness over McBurney's point, slight fever some diarrhea, moderate leucocytosis, and pain in his joints Examination

address is as follows 'Some Activities of the New York Psychiatric Institute and Hospital.'

OSCAR J. RAEDER, M.D., *Secretary*

HARVARD MEDICAL SOCIETY.

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, February 27, at 8 15 o'clock.

PROGRAM

Presentation of Cases

"Reminiscences" By Dr. George B. Magrath.

JOHN HOMANS, M.D., *Secretary*

BOSTON CITY HOSPITAL

STAFF CLINICAL MEETING

Tuesday, February 27, 1934 at 8 00 P.M.

Cheever Amphitheatre

1. Surgical Aspects of Acute Pancreatitis with Reports of 60 Cases from Boston City Hospital. Drs. Francis F. Henderson and Elmer S. A. King
2. The Effect of Ligation of the Hepatic Artery. Dr. Stephen J. Maddock.
3. End Results in Carcinoma of the Stomach. Dr. Charles C. Lund.
4. The Influence of Anesthesia on the Pulmonary Circulation Time. Drs. Charles A. Lamb, John Shaw, and Brandt F. Steele
5. Obstruction of the Colon by Gall Stones, Review of the Literature and Case Report. Drs. Irving J. Walker and Henry F. Howe
6. Congenital Arterial Venous Fistulae. Dr. E. Everett O'Neil.
7. Plasma Lipids as an Aid in the Interpretation of Jaundice. Dr. Earl R. Lehnher.

COMMITTEE ON HOSPITAL CLINICS

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The regular meeting of the New England Physical Therapy Society will be held in the Banquet Hall of the Hotel Victoria, 271 Dartmouth Street, Boston, at eight o'clock in the evening of February 21, 1934.

This meeting will be conducted by Dr. Arthur H. Ring.

PROGRAM

The Present Status of Fever Therapy (With motion film.) Arthur H. Ring, M.D., Arlington.

Hyperpyrexia at the Boston Psychopathic Hospital. Samuel H. Epstein, M.D., Boston.

It is hoped that this symposium on fever therapy will be of interest and value and that it will bring out important general discussion which will be opened by Dr. Joseph S. Barr, Boston.

A report of progress of the Legislative and Educational Committee which should be of interest to all of the members will be presented at this meeting.

Council Meeting at six Round Table Dinner at six thirty

All members of the medical profession interested in

this subject are cordially invited to attend and to participate in the discussion.

ARTHUR H. RING, M.D., *Secretary*

PHI DELTA EPSILON FRATERNITY, BOSTON UNIVERSITY SCHOOL OF MEDICINE

There will be an open meeting of the Phi Delta Epsilon Fraternity of the Boston University School of Medicine at the Evans Memorial Hospital Auditorium, 80 East Concord Street, Boston, on Friday, February 16, 1934, at 8 P.M.

The topic for discussion will be The Treatment of Angina Pectoris and Congestive Heart Disease by the Total Ablation of the Normal Thyroid Gland.

The speakers

Medical aspect Dr. Herrman L. Blumgart.

Surgical aspect Dr. David Berlin.

The discussion will be led by Dr. William D. Reid. Physicians and medical students are invited.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

The next meeting of the New England Ophthalmological Society will be held at the Massachusetts Eye and Ear Infirmary, 243 Charles Street, Boston, on Tuesday, February 20, 1934.

PROGRAM

- 9 00 A.M. Clinic and Operating room
- 11 30 A.M. Neuro-Ophthalmological Conference.
- 2 00 P.M. Ward rounds
- 3 00 P.M. Clinico-Pathological Conference

EVENING PROGRAM 8 00 O'CLOCK

Papers

1. The relative value of different methods, including examination of fundi for the detection of early arteriosclerosis in diabetes mellitus. Dr. I. M. Rabinowitch, Dr. W. S. Ritchie, Montreal General Hospital.

2. Ocular complications in diabetes. Dr. J. Herbert Waite

Discussion. Dr. Elliott P. Joslin, Dr. Fred M. Spalding

Professor A. Bielschowsky on a visit to this country will address the society on Monday, March 12, and give a comprehensive course in ocular muscles on March 13, 14, 15, 16. The course will be given in English.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

February 15—Massachusetts General Hospital, Clinical Meeting of Staff will be held in the Moseley Memorial Building at 8 15 P.M.

February 15—New England Women's Medical Society will meet at the Hotel Vendome at 6 30 P.M.

February 16—Phi Delta Epsilon Fraternity. See notice above

February 16—New England Section of the Illuminating Engineering Society will meet in the Amphitheatre of Building C of the Harvard Medical School at 7 45 P.M.

myocardial degeneration than had been suspected during life. There was a congenital lesion of the mitral valve which was of interest as a rare type of lesion rather than of any clinical significance. The lesion consisted of one leaflet of the mitral valve being in practically two layers with unusual attachments of the chordae tendineae. (This specimen is now preserved in the Harvard Medical School.) There was a bronchopneumonia and a peribronchitis with a histological structure suggesting the type of lesion found during the so-called influenza epidemic in those cases in which the influenza organism was the complicating factor. No evidence of the hyaline membrane which is characteristic of the epidemic disease was found. This case is of interest in that it adds further support to the idea that the influenza organism was only a complicating factor in certain of the cases of the epidemic disease prevalent in 1918-1919. The epidemic disease clinically when it extends down the respiratory tract and before or after complications develop is characterized by a bloody wet expectoration, in contrast to the rusty sputum of lobar pneumonia or purulent sputum of bronchopneumonia or bronchiectasis. This was absent in this case as was the hyaline membrane on histological study, while the influenza organism was present with the typical histological picture of peribronchitis.

Drs. James R. Torbert, Raymond S. Titus and DeLos J. Bristol of the Obstetrical Staff presented three interesting cases of obstetrical hemorrhage.

Dr. Torbert preceded the presentation of his case by a few general remarks in regard to obstetrical hemorrhage in which he emphasized the danger of sepsis in these cases and the prolongation of the convalescence in those which survive. He also emphasized the importance of not examining these patients until they have arrived at the hospital where appropriate treatment can be instituted. The case which Dr. Torbert presented was one of premature separation of the placenta due to unexplained toxic causes. In the discussion of this case the procedure of packing the cervix and putting on pressure by binders over the uterus to stop the hemorrhage with eventual delivery of the child was explained. As the babies in these cases are dead the object of treatment is to save the mother without regard to the child.

Dr. Titus presented a case of placenta accreta with bleeding and emphasized the fact that if this diagnosis is made the uterus should be sacrificed.

Dr. Bristol presented a case which bled off and on through pregnancy, which apparently was due to a partial placenta previa. He called attention to the fact that there is not always unanimity of opinion in regard to what constitutes a placenta praevia, but he feels that any overlapping of the cervix by the placenta after the cervix has been dilated should be looked upon as a placenta previa. He also emphasized the importance of inspection of the cervix early in the course of the pregnancy if bleeding occurs.

In the discussion which was participated in by

many of those present, emphasis was laid upon the importance of having a definite knowledge of the condition of the cervix in regard to the degree of dilatation before deciding upon the best procedure for dealing with complications. The use of pituitrin intravenously during the past five years has done away with the need of intrauterine douches and packing to a great extent and is looked upon as a distinct advantage in obstetrics.

The next meeting will be held at the Faulkner Hospital at 5:00 P.M. on Thursday, March 1st. In addition to the usual clinical pathological conference on the cases which have come to autopsy during the month, Dr. Burton E. Hamilton will give a short talk on "Recent Advances in the Clinical Use of the Electrocardiogram."

BOSTON MEDICAL HISTORY CLUB

SPRAGUE HALL, 8 FENWAY

MONDAY, FEBRUARY 19, AT 8:15 P.M.

"Nicholas of Cues and His Collected Works" Henry R. Viets, M.D.

"Egyptian Mummification, Including Some Recent X-Ray Studies Made at the Boston Museum of Fine Arts" Francis T. Hunter, M.D.

Illustrated by Stereopticon

Light refreshments after the meeting

JAMES F. BALLARD, *Secretary*

SOCIETY FOR THE PREVENTION OF ASPHYXIAL DEATH, Inc.

The Annual Meeting will be held at The Biltmore Hotel, New York City, Monday, February 19, Tuesday, February 20.

Papers by medical leaders: Drs. Chevalier Jackson, Charles Norris, Yandell Henderson, James J. Walsh, Wendell C. Phillips, Horatio B. Williams, Harrison S. Martland, Pol N. Coryllos, Henry Hall Forbes and the Representatives of the Surgeon Generals of the Army, the Navy and The Public Health Service of the U.S.A.

Scientific exhibits: Specimens, Charts, Demonstrations

Sound pictures

Technical exhibit: Apparatus for Resuscitation.

Conference Dinner: February 20. A testimonial to the late Dr. Joseph O'Dwyer (Pioneer in the Prevention of Asphyxial Death). Toastmaster, Dr. Chas. Gordon Heyd. Speakers: Drs. William P. Northrup, John A. Hartwell and others.

MASSACHUSETTS PSYCHIATRIC SOCIETY

The next meeting of the Massachusetts Psychiatric Society will be held at the Boston Psychopathic Hospital on Friday, February 23, 1934, at 8 P.M. The speaker of the evening will be Dr. Clarence O. Cheney, Professor of Psychiatry at Columbia University, New York, and Director of the New York Psychiatric Institute and Hospital. The title of his

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NEW ENGLAND SURGICAL SOCIETY

THE OPERATIVE MANAGEMENT OF CANCER OF THE RECTUM*

BY RICHARD B. CATTELL, M.D.,† AND FRANK H. LAHEY, M.D.‡

CARCINOMA of the rectum is frequently encountered by the general surgeon and is amenable to relief by surgery if the diagnosis is made sufficiently early and an adequate operation performed. Our operative management of these cases has changed considerably in the past five years and this has resulted in a lower operative mortality. Three hundred and seven (307) patients with carcinoma of the colon and rectum have been operated upon at the Clinic. We wish, however, to review those cases treated from nineteen hundred and twenty-eight to nineteen hundred and thirty-three inclusive since the operative management has been improved and standardized during this period. Two hundred and two (202) patients with carcinoma of the large intestine were operated upon during this time. In this group seventy-eight (78) occurred in the colon while one hundred and twenty-four (124) were found in the rectosigmoid and rectum. In a consideration of carcinoma of the large intestine, based on the anatomy of the two regions these patients readily fall into the two groups of rectal and colon lesions. The portion of the colon from the cecum to the redundant portion of the sigmoid is so readily mobilized that segments can be removed preserving the blood supply of the remaining portion and permitting approximation of the divided ends either by immediate suture or by a Mikulicz plan of anastomosis. The rectum cannot be mobilized and moved in the same way without destruction of the blood supply and suture in the greater portion of the rectum not covered by peritoneum is inadvisable. Cases of carcinoma of the colon and sigmoid will be excluded in this discussion and the operative management of one hundred and twenty-four (124) patients with carcinoma of the rectosigmoid and rectum will be reviewed. These patients have been operated upon by three surgeons using the same methods and the material presented represents the work of all.

The diagnosis of cancer of the rectosigmoid and rectum should not be difficult in suspected

cases. Too little attention has been paid in the past to the earliest symptoms that occur and all too frequently, these patients have come to the surgeon because of obstruction or symptoms due to spread of the disease beyond the bowel. If the operability of patients with cancer of the rectum is to be increased, it must come through education of the lay public to seek medical advice on the first appearance of blood, mucus or change in their bowel habits. In these suspected cases, it is necessary for the physician who is consulted to do a careful rectal examination. If this is negative, it should be followed by proctoscopic examination and barium enema. As has been frequently pointed out by surgeons interested in this subject the presence of hemorrhoids discovered by digital or anoscopic examination, does not prove these to be the source of the symptoms unless a lesion higher in the bowel is ruled out.

Fortunately, cancer of the rectum in most cases is slow-growing and remains confined to the bowel for a considerable period of time before lymphatic involvement occurs. In the past ten years the operability rate in our cases has gradually risen from fifty per cent to sixty-two per cent in nineteen hundred and thirty-two—that is, in this last year, sixty-two per cent of the patients operated upon had growths which could be submitted to radical resection. Fifty-eight cases or forty-seven per cent of this series were inoperable. It is very difficult to determine operability by rectal and abdominal examination, previous to operation of this group. In nine patients definite extension and fixation in the region of the prostate or uterus extension to the inguinal glands or liver or other probable abdominal masses were demonstrated and no operation was performed. Five patients had abdominal exploration were found to be inoperable and in the absence of actual or impending obstruction, only exploration was done. In the remainder, a permanent colostomy was established. We feel that colostomy in addition to relieving obstruction as well as preventing its later occurrence, adds greatly to the comfort of these patients. It has not prolonged life in these cases. In order not to make the colostomy any greater burden than is necessary, it is important to instruct these patients in the care of this ar-

Read at the Annual Meeting of the New England Surgical Society at Boston, September 29, 1933.

†Cattell, Richard B.—Surgeon at the Lahey Clinic and New England Deaconess Hospital. Lahey, Frank H.—Director, Lahey Clinic, Surgeon-in-Chief, New England Baptist Hospital. For records and addresses of authors see "This Week's Issue" page 43.

February 16—The New England Roentgen Ray Society will meet at the Boston Medical Library Friday evening

February 16 and 17—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club Boston For details write Dr A. G. Engelbach Massachusetts General Hospital, Boston

February 19—Boston Medical History Club See page 400

February 19 and 20—Society for the Prevention of Asphyxial Death See page 400

February 20—New England Ophthalmological Society See page 401

February 20—South End Medical Club will meet at the office of the Boston Tuberculosis Association at 12 noon

February 20—Malden Medical Society will meet at the Malden Electric Company Hall at 8 30 P M

February 21—New England Physical Therapy Society See page 401

February 23—Massachusetts Psychiatric Society See page 400

February 26—New England Heart Association will meet in the Amphitheatre of the Childrens Hospital at 8 15 P M

February 27—Boston City Hospital Staff Clinical Meeting See page 401

February 27—Harvard Medical Society See page 401
March 1—Faulkner Hospital Clinical Meeting See page 400

March 5, 6 and 7—The Southeastern Surgical Congress will be held at Nashville Tenn For information write Dr B T Beasley, 1019 Doctors Building, Atlanta

March 9—William Harvey Society at Beth Israel Hospital. Speaker Dr Irving J Walker, Clinical Professor of Surgery, Harvard Medical School Subject Judgment and Conscience in Surgery

March 12—House Officers Association, Boston City Hospital, 8 P M Speakers Drs A. Warren Stearns Abraham Myerson Subject Forensic Psychiatry

April 16—Boston University School of Medicine to Conduct a Clinical Meeting at Boston City Hospital

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E R. Loveland Executive Secretary 133-135 South 36th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C Guy Lane, 416 Marlboro Street, Boston, for details

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H R. Schnitz General Secretary Dr H E Walther, Gloriastrasse 14 Zurich

September 3 6—American Public Health Association, at Pasadena, California Dr J D Dunshee, Chairman Local Committee on Arrangements

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York, N Y

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday, March 7—Lynn Hospital Clinic 5 P M. Dinner 7 P M Speaker Dr Frank H. Lahey Boston. Subject to be announced Film Electrocardiogram

Wednesday, April 4—Essex Sanatorium Middleton Clinic 5 P M. Dinner 7 P M. Speakers Dr Elliott P Joslin and Dr Howard F Root Boston. Subject Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting, at Salem Hospital 3 30 P M

Tuesday, May 8—Annual Meeting Salem Country Club Forrest Street, Peabody Dinner at 7 Speaker to be announced. Subject to be announced

RALPH E STONE M.D. Secretary

221 Cabot Street, Beverly Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary

Sunderland, Mass

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place in March (2nd Wednesday) at Wakefield and May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D. Secretary

76 Church Street Winchester Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T A. STAMAS M.D. Secretary
226 Central Street Lowell, Mass

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

February 20—Meeting at the Metropolitan State Hospital Waltham 5 P M

NORFOLK DISTRICT MEDICAL SOCIETY

February 27—Hotel Kenmore 8 30 P M Dr J H. Shortell 'Industrial Medicine and Surgery'

March 27—Faulkner Hospital, 8 30 P M Dr Henry H. Faxon and Dr Edward A. Edwards Symposium on "Varicose Veins Discussion by Dr E E O'Neill.

April 17—Hotel Kenmore 8 30 P M Special Business Meeting

May—Annual Meeting Time place and program to be announced

FRANK S. CRUICKSHANK, M.D. Secretary
1695 Beacon Street, Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital Speaker Dr Elliott P Joslin Subject Diabetes

May 3—12 noon at Norfolk County Hospital Annual Meeting Election of Officers

N R. PILLSBURY M.D. Secretary
Norfolk County Hospital South Braintree Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program, titles and speakers to be announced

The Medical Profession is cordially invited to attend all of these meetings

JAMES H. MEANS M.D., Vice-President.
GEORGE P. REYNOLDS M.D., Secretary,
311 Beacon Street Boston Mass

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

March 14—Dinner and scientific program at the Memorial Hospital Worcester Mass.

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C. MILLER, M.D., Secretary
27 Elm Street Worcester, Mass

BOOK REVIEW

The Pregnant Woman By PORTER BROWN Published by Eugenics Publishing Company, Inc 174 Pages Price, \$2 00

This monograph by Dr Porter Brown of Salina, Kansas, produced under the auspices of the Eugenics Publishing Company, aims to be a suitable manual for guidance of patients before and during pregnancy. So far as any manual of this sort is desirable, this volume seems to be as satisfactory as any of its type. Without any reflection upon the author, however, one cannot help questioning the ethics of the statement incorporated by the publishers in the announcement of the book that "All who purchase the 'Pregnant Woman' will be privileged to obtain personal advice on pregnancy from the author."

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Fortunately, cancer of the rectum in most cases is slow-growing and remains confined to the bowel for a considerable period of time before lymphatic involvement occurs. In the past ten years the operability rate in our cases has gradually risen from fifty per cent to sixty-two per cent in nineteen hundred and thirty-two—that is, in this last year, sixty-two per cent of the patients operated upon had growths which could be submitted to radical resection. Fifty-eight cases or forty-seven per cent of this series were inoperable. It is very difficult to determine operability by rectal and abdominal examination, previous to operation of this group. In nine patients definite extension and fixation in the region of the prostate or uterus, extension to the inguinal glands or liver or other probable abdominal masses were demonstrated and no operation was performed. Five patients had abdominal exploration, were found to be inoperable and in the absence of actual or impending obstruction, only exploration was done. In the remainder, a permanent colostomy was established. We feel that colostomy in addition to relieving obstruction as well as preventing its later occurrence adds greatly to the comfort of these patients. It has not prolonged life in these cases. In order not to make the colostomy any greater burden than is necessary, it is important to instruct these patients in the care of this ar-

Read at the Annual Meeting of the New England Surgical Society at Boston, September 29, 1933.

†Cattell, Richard B.—Surgeon at the Lahey Clinic and New England Deaconess Hospital. Lahey, Frank H.—Director, Lahey Clinic, Surgeon in Chief, New England Baptist Hospital. For records and addresses of authors see "This Week's Issue" page 43.

tificial anus In most cases, it is best done by means of a constipating diet with a movement every second or third day by means of a colostomy irrigation It is best in addition to take a small rectal enema once or twice each week to clear out the tumor-bearing segment of the bowel of its discharge

The operative mortality following colostomy in the inoperable cases may be high due to the poor condition of these patients In the group of forty-four patients where a colostomy was done, five died following operation (eleven per cent) a mortality which is equal to that following resection in favorable cases The average length of life in the inoperable cases has been approximately one year while only one has lived longer than two years While this group of patients is very discouraging to deal with, we feel that colostomy is worth while in most patients

There is a small group of patients with carcinoma of the rectum in whom the operability is doubtful, in whom there is considerable spread to the regional glands, attachment to bladder, small intestine or peritoneum If resection is carried out in these cases, it must be considered as a palliative resection In those cases of this type that we have submitted to resection, we have usually regretted doing it and felt that it was not justified by the results This is even more true in cases with involvement of the liver While increased comfort may be gained by resection of such primary lesions, the short duration of life and the high operative mortality, we feel, contraindicate resection

Resection of the rectosigmoid and rectum was performed in sixty-six (53%) of the one hundred and twenty-four cases in this series Sixty-one were considered favorable cases, while five were of the type that might be termed "palliative resections" We believe that no one type of operation is adaptable for all lesions of the rectosigmoid and rectum Previous to nineteen hundred and twenty-eight, the abdominoperineal resection in one stage (Miles) was employed as a routine This resulted in a high operative mortality Since that time four types of operations have been utilized The type to be used in the individual case cannot usually be decided upon before abdominal exploration The four types of operations which are now utilized are the following first, the abdominoperineal resection in one stage (Miles), secondly, the abdominoperineal resection in two stages after the method described (F. H. Lahey) in nineteen hundred and twenty-nine, thirdly, abdominal or anterior resection in one stage, and fourthly, loop colostomy and posterior resection in two stages The Miles type of resection is carried out only in the very good risk patients without symptoms of obstruction There seems to be a general feeling in this country at present that the Miles type of resection should be done much more frequently Because of our previous experience, we feel that the too wide use of it will

result in a prohibitive operative mortality In most cases, we prefer the abdominoperineal resection in two stages The advantages of this operation will be briefly presented later in the discussion together with a consideration of its technique

In a small group of patients where the lesion is located high in the rectosigmoid, a resection can be carried out entirely by the abdominal approach, leaving a small segment of rectum and anus below a reconstructed peritoneal floor When this operation is done a drain should be inserted through the perineum up to the stump of buried rectum In properly selected cases, there is little danger of recurrence in the rectal stump The posterior or perineal resection is particularly adaptable to the poor risk patients and particularly in those who are very obese. In our opinion, the conservation of the anal sphincter should not be attempted in carcinoma of the rectosigmoid and rectum Likewise any operation which results in a perineal colostomy is usually much less satisfactory than the ordinary left-sided colostomy

The resections done in this series are divided as follows

TYPE OF OPERATION—66 Resections

Lahey	33
Miles	5
Anterior Resection	11
Posterior Resection	16
Local Excision	1
All Types	66

It is very important to have these patients in the best possible condition at the time of operation and all measures for accomplishing this should be carried out In the cases uncomplicated by obstruction, a two or three day period is sufficient for this purpose It is advantageous to have the bowel as empty as possible and this can usually be accomplished by means of repeated enemata A mild saline purge is frequently given although it should not be used the day before operation It is especially necessary to empty the bowel of barium Fluids, of course, and a low residue, high caloric diet are given If the hemoglobin is below seventy, blood transfusion is done

In the presence of definite bowel obstruction, a preliminary operation is carried out We prefer a left-sided colostomy for the relief of obstruction in most cases, however, in long standing obstruction, cecostomy is resorted to Adequate drainage in these cases is essential and cannot be obtained by a tube cecostomy or ileostomy In these cases, we bring a portion of the cecum through the abdominal wall so that when it is opened, a large opening is present In order to accomplish this, approximately one third of the circumference of the cecum must be delivered through the wound After the immediate relief of obstruction, irrigation can then be carried out satisfactorily These fistulae may close spon-

taneously or may require later operative closure. In three patients, the preliminary drainage was placed in the transverse colon. In patients with partial obstruction, with either the Lahey type of resection or posterior resection, the obstruction can be satisfactorily relieved during the ordinary first stage of either of these operations.

Spinal anesthesia, combined intratracheal ethylene anesthesia and local anesthesia have been used. Local anesthesia is very unsatisfactory and is used only in the preliminary operations for the relief of obstruction. Spinal anesthesia is preferred when applicable because of the very satisfactory relaxation that it gives. This is of sufficient duration to permit the completion of the abdominal portion of the operation and can be supplemented if necessary by nitrous oxid or ethylene for the completion of the perineal part. In the poor risk patients, ethylene is administered through an intratracheal catheter using local infiltration of the wound for additional relaxation. A small amount of ether can be given for closure. This is the safest form of anesthesia for these cases.

It will be seen from the figures presented that we choose the two-stage abdominoperineal resection most frequently, since thirty-three or fifty per cent of the resections were of this type. Since the operation we employ was originally described from this Clinic we should like to report our experience with this. A number of surgeons, who have felt that it was advantageous in many cases, have reported to us their satisfaction with its employment. The operation that we now do is essentially the same as originally described, but has been modified somewhat as shown in Figures I to IX. At the first operation, the primary incision may be either a lower midline or left rectus. There are certain advantages in utilizing the left rectus incision (Fig I, inset). Since the first stage deals primarily with the sigmoid, (Fig I,) it is somewhat easier to mobilize this through the lateral approach and it is easier to close the peritoneum laterally (Fig III) between the divided bowel and the left parietes. The lateral gutter is always closed in order to prevent small bowel obstruction. Where the lateral incision is used, the secondary stab incision is then made suprapubically (Fig II). When this has been done, it permits the abdominal incision at the second stage to be made through a new area uncomplicated by previous incisions, less adhesions are encountered and it is somewhat easier to mobilize the implanted distal segment (Fig VII). However, a curved clamp is necessary in order to be able to place it on the bowel through the stab wound in the midline (Fig II). The sigmoid is divided at the first stage, (Fig II,) drawing out the proximal bowel through the lateral incision in the usual place for a permanent colostomy. The mesentery is divided down to but carefully preserving the superior hemorrhoidal vessels

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In the presence of a partial obstruction the proximal loop can be drawn out sufficiently so that after the wound has been closed, a tube can be placed in the bowel for immediate drainage. Otherwise, the clamp is left on the proximal segment for thirty-six to forty-eight hours. This obstruction is well tolerated without discomfort for this period of time. The lower clamp is removed in six days, following which through and through irrigations are carried out three times daily as illustrated in the accompanying figure (Fig VI). These irrigations are continued for seven to ten days, allowing the patient out of bed after the eleventh or twelfth day. The second stage of the operation is carried out usually about the fifteenth day. The suprapubically implanted distal bowel is freed through the lower median incision (Fig VII) and the superior hemorrhoidal vessels ligated and divided (Fig VIII). From this point the operation is the same as the Miles resection. After the rectal attachments are divided, it is usually necessary to remove a segment of the bowel before placing the remainder of the rectum in the hollow of the sacrum. Great care is used in restoring a firm and adequate pelvic peritoneal floor (Fig VIII, inset). In women this suture line is usually reinforced by the uterus, while in men, a considerable portion of the peritoneum is freed from the bladder so that this suture line is without tension.

The perineal part of the resection has no unusual details (Fig IX). Formerly this was carried out with the patients placed on their abdomens but this resulted in rather severe depression as evidenced by a fall in blood pressure. All of the perineal resections of this series have been performed with the patient on his side. This slight shift in the position on the operating table produces only a moderate fall in pressure and the operation is no more difficult in this position. The perineal part of the operation is much easier if the rectum has been freed well beyond the tip of the coccyx, behind and away from the bladder, vagina or prostate. If this is done, it may be unnecessary to remove the coccyx. While we have removed the coccyx in most cases, it frequently results in postoperative pain in this region which may last for many months. This will be obviated if the coccyx is left in place, although we do not hesitate to remove it if it improves exposure.

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FIGURES I V RESECTION OF THE RECTUM FIRST STAGE

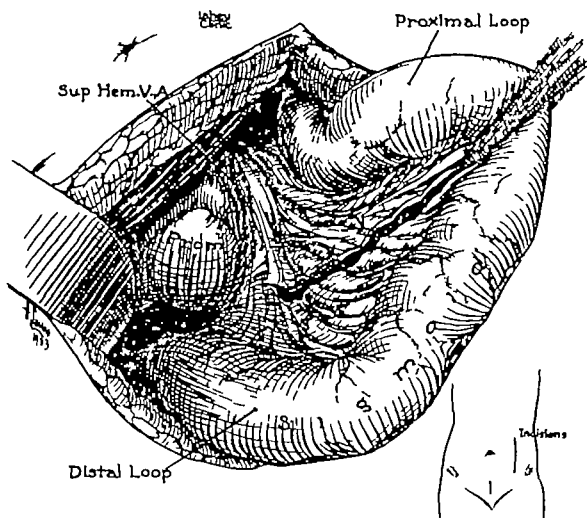


FIGURE I Through a left rectus incision the sigmoid colon is mobilized by division of the parietal peritoneum and the mesentery is divided vertically down to but preserving the superior hemorrhoidal vessels. The inset indicates the relative position of the primary and stab incisions

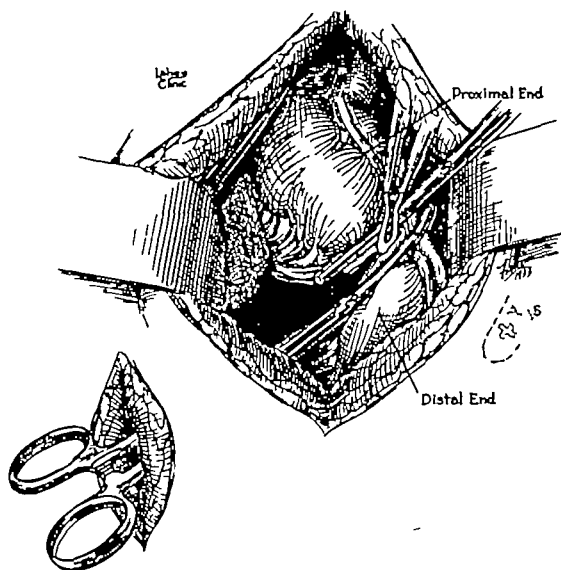


FIGURE II A counter stab incision is made suprapubically in the median line through which a curved clamp is passed to grasp the bowel distal to the point to be divided. A second clamp is placed on the proximal end through the primary incision

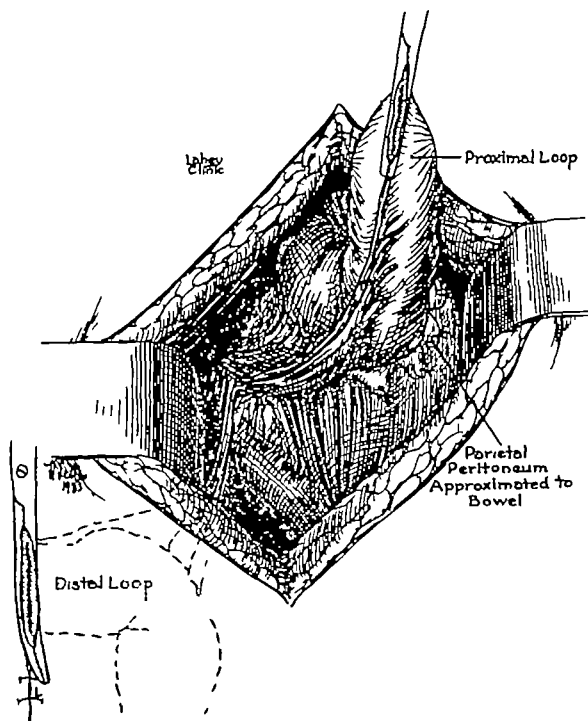


FIGURE III The proximal bowel which becomes the permanent end colostomy is attached to the lateral parietal peritoneum to preclude the possibility of small intestine strangulating in this opening. The distal bowel is pulled through the stab incision.

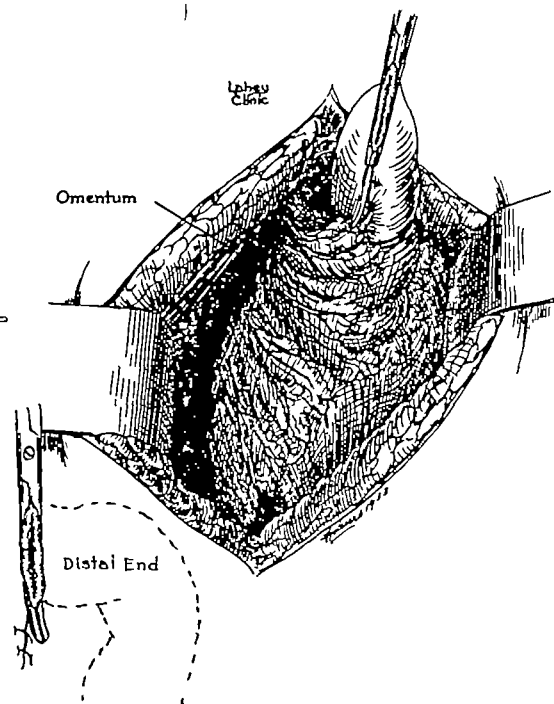


FIGURE IV In order to prevent the small intestine from becoming adherent along the line of the divided mesentery the omentum is loosely sutured over this area

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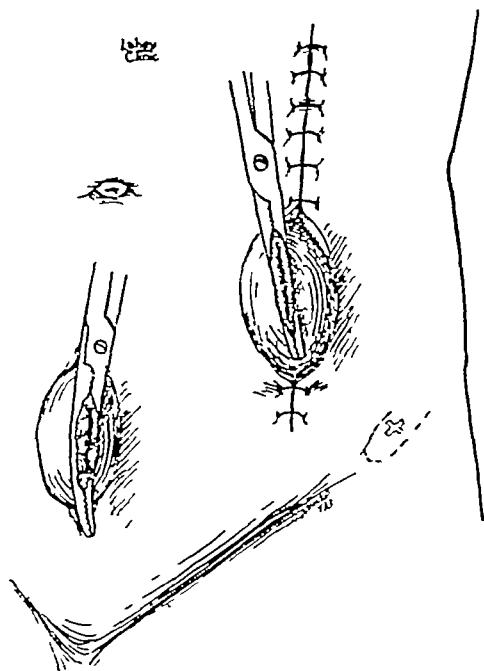


FIGURE V First-stage resection of the rectum completed. Clamps remain on both the proximal and distal ends of the bowel which hold them securely in the wound until firm adhesion takes place. The upper clamp is removed in forty-eight hours and the lower one in four to six days. The bowel is not sutured at any point to anchor it in the wound.

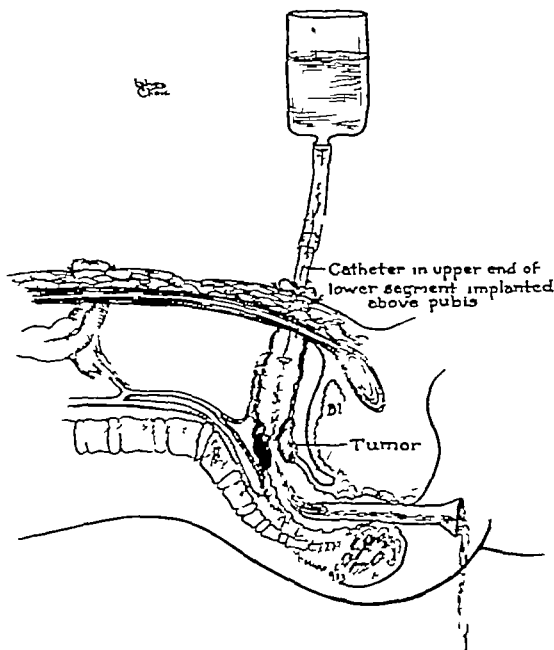


FIGURE VI. A diagram showing the methods of irrigation of the isolated tumor bearing segment of bowel. Beginning on the fifth or sixth day irrigations are carried out three times daily until the irrigating fluid is clear. In case the tumor is obstructing and does not permit through and through irrigation the upper portion is washed out by means of a catheter and the lower portion with a rectal tube. Irrigations are carried out for seven to ten days when the second stage is done.

of this operation but since its use, only one patient has died of peritonitis which was due to the failure of the pelvic peritoneum to hold. In four of these operations, the bowel has been opened during the abdominal dissection and peritonitis did not occur. In an uncleansed segment of bowel this would have resulted fatally. Surgical shock is much less frequently seen than after the one-stage operation.

Three objections might be presented to this type of resection. The operation is not divided into two equal stages but we know of no means of doing this whereby as much bowel and mesentery can be removed as in this or the Miles resection. Again, the colostomy as performed in this first stage is more of a surgical procedure than simple colostomy. It has been suggested that the second stage is more difficult because of reopening the abdomen a second time. This difficulty has not been evident in our experience particularly where the left-sided incision is used for the first stage. It is a definite help to anchor the omentum at the first stage over the divided mesentery of the sigmoid (Fig IV). In addition these adhesions are fresh and readily separated by gentle blunt dissection. We believe that these minor objections are much more than compensated for by the advantages of the method and the results obtained.

A considerable operative mortality must be expected after radical operation for cancer of the rectum. In this group of sixty-six operable patients, resection was performed in sixty-two with five deaths, an operative mortality of 8.1 per cent. Forty-five consecutive resections of the rectum were performed without mortality, the last death occurring in September nineteen thirty-three while the one previous to that occurred in February, nineteen thirty. Three of the deaths occurred after the Lahey type of resection. The first in nineteen twenty-nine died on the first day after operation from surgical shock, the second death occurred in February, nineteen thirty, twelve days after operation from pneumonia, while the third died in September, nineteen thirty-three on the tenth day from peritonitis. Another death occurred in nineteen twenty-nine following another type of abdominal perineal resection in two stages, this occurred on the ninth postoperative day from pneumonia. Eleven anterior or abdominal resections were done without mortality. Fifteen posterior or perineal resections were done with one operative death, which occurred on the fourth day after operation from peritonitis.

In addition to the five deaths after radical resections, four deaths occurred following colostomy. Autopsy showed that two were due to pulmonary emboli, one caused by pneumonia, while the fourth was due to central necrosis of the liver.

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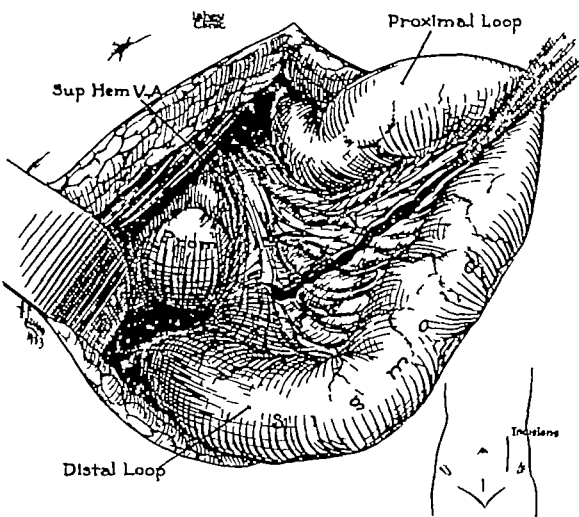


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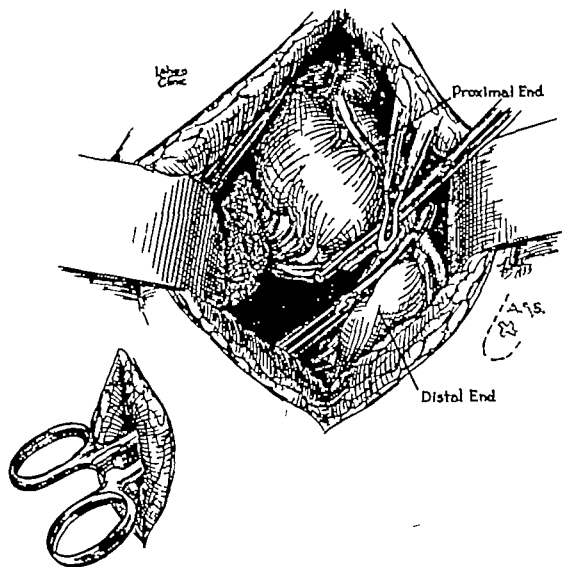


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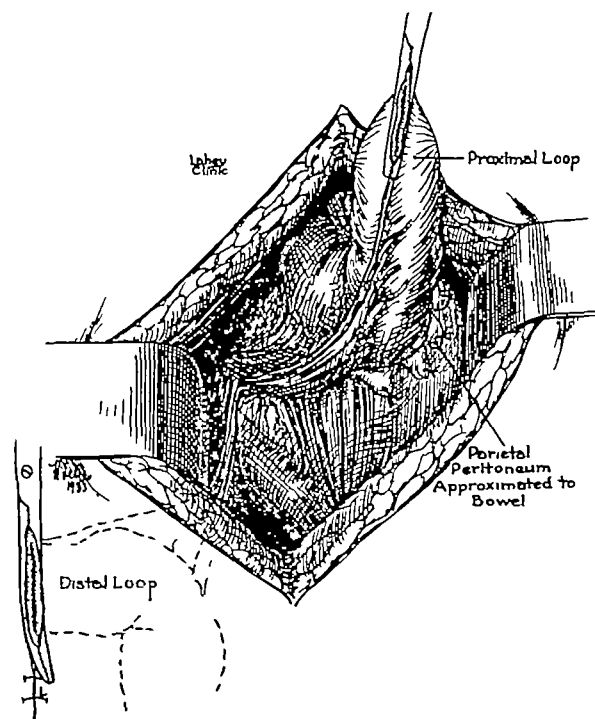


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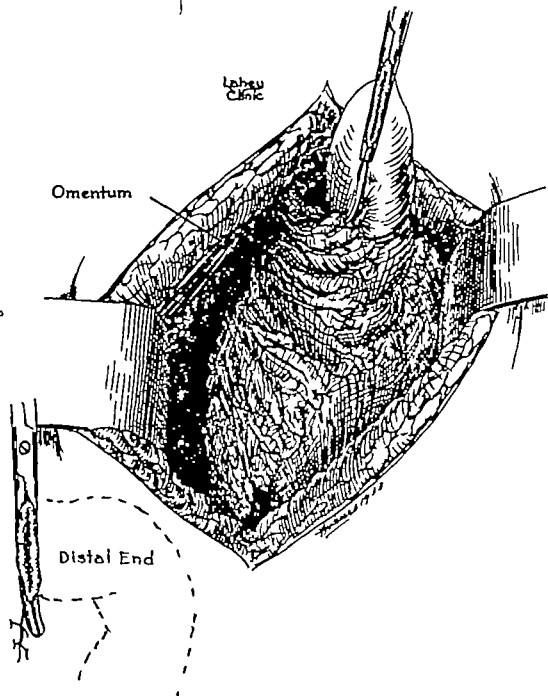


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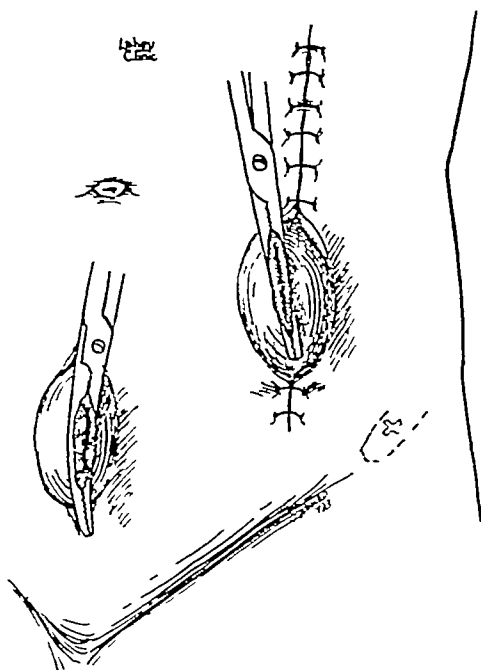


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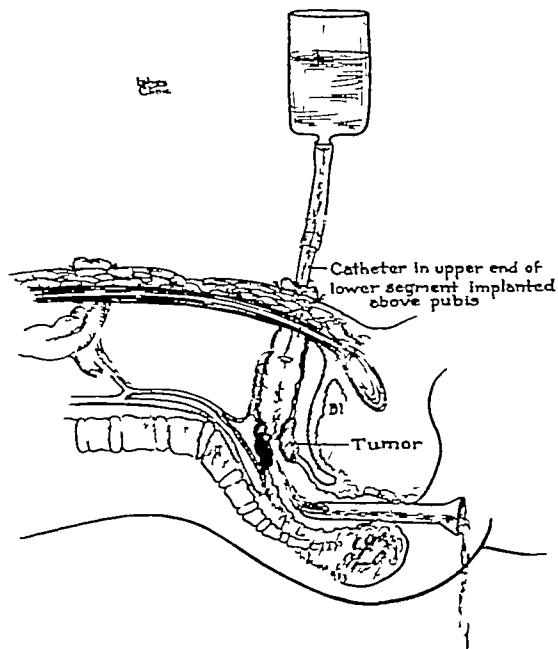


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FIGURES VII IX RESECTION OF THE RECTUM SECOND STAGE

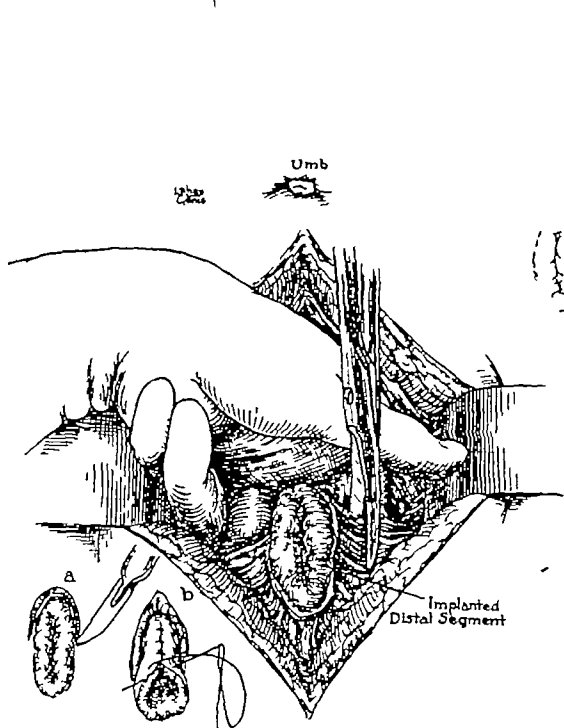


FIGURE VII The insets a and b show the preliminary closure of the implanted distal segments before the abdomen is prepared. The colostomy is then walled off and the usual abdominal preparation done. The abdomen is opened in the midline just below the umbilicus and the hand introduced in the manner shown around the implanted loop. The fresh adhesions of the omentum and small bowel are freed. In this manner the implanted loop can be quickly detached from the wound.

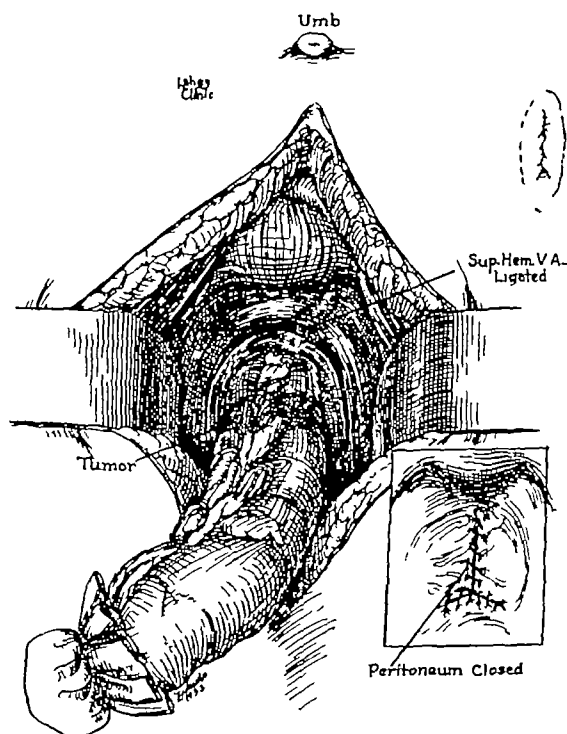


FIGURE VIII—The end of the bowel is covered with a sheet of rubber dam, the entire segment freed up and pulled down ward when the superior hemorrhoidal vessels come into view and are ligated and divided. The pelvic peritoneum is then incised as indicated and the entire rectum freed up from the hollow of the sacrum. After freeing it laterally and anteriorly from the bladder and prostate or vagina the segment is placed in the hollow of the sacrum. At times a portion must be removed if the segment is too long. The inset shows the reconstruction of the pelvic peritoneum.

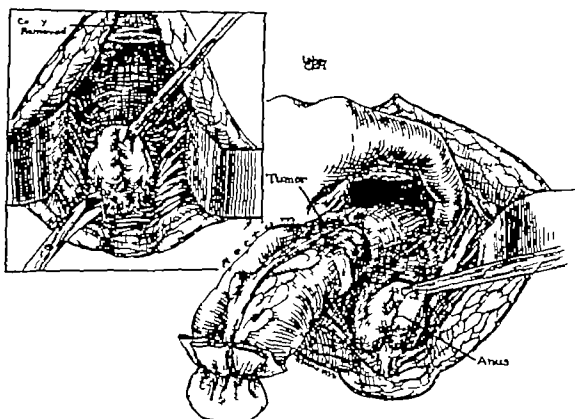


FIGURE IX The perineal excision is done in a modified Sims position. The inset shows the coccyx removed and the anal segment freed up. The entire segment of the bowel is now delivered from the hollow of the sacrum and the levators and other attachments divided. A loose gauze pack is placed in the cavity and the wound loosely closed.

state the mortality correctly with the five deaths after resections and four deaths after colostomy, the total operative mortality is 13.6 per cent. While the total operative mortality in these cases was thirteen and six-tenths per cent, the fact that for one period forty-five consecutive

resections were done without mortality, indicates that in the favorable and uncomplicated cases, a mortality of under ten per cent may be maintained.

All patients are transfused routinely after the abdominoperineal resection and whenever indicated in resections of any other type. This has materially lessened the incidence of surgical shock. Peritonitis has occurred but once in this series whereas in a previously studied group it occurred in seven of eight fatal cases. The common pulmonary complications of pneumonia and pulmonary embolus seem to be unavoidable in an occasional case. It seems that the circulation can be definitely improved between stages by having the patients up for several days before carrying out the second stage. Abdominal wound infection is not infrequent but clears up readily under ordinary measures. The perineal wound is irrigated for two or three weeks after operation and the perineal sinus requires one to three months to entirely close. Cystitis is the most common postoperative complication. Both male and female patients are placed on constant drainage for five to ten days following resection. Bladder irrigations help to diminish the

infection and make the patient more comfortable. We have not been able to avoid this complication and feel that it is due to the necessary trauma to the bladder, prostate and urethra in carrying out a radical excision of the perirectal tissues.

The end results in favorable cases of carcinoma of the rectum that have been submitted to radical excision are satisfactory. Forty-two per cent of the patients operated upon in this Clinic previous to nineteen twenty-nine, have been well and free of recurrence over five years. In order to get a general idea of the results that can be expected in patients with carcinoma of the rectum, it can be stated that a little more than half of the cases coming for examination are operable. Approximately half of this group survive a five year period without recurrence, so that it can be said that one patient in four with cancer of the rectum can be relieved by surgery. This incidence of relief compares favorably with cancer in other locations in the body. With earlier diagnosis, a lowered operative mortality and an adequate operation, better results can be expected.

DISCUSSION

DR. FRANK H. LAHEY, Boston, Mass. I think that there are three features about cancer of the rectum which we should always have in mind. One is physiologic, that is, the rectum is a storage place therefore since feces must be stored there nature has supplied it with a limited number of lymphatics. That is a good feature from the point of view of not having metastasis. Next, the type of lesion is benign. Most of these lesions are adenocarcinomata or malignant adenomata and the fact that such a large number are adenocarcinomata makes one even more convinced that a great majority of them are like the degenerated adenomata of the thyroid originating in previously existing benign adenomata. Next, the rectum lends itself almost ideally to complete surgical removal together with its adjacent lymphatics and so all in all as is proved by end results of everyone who has dealt with the subject, it is an extremely favorable field.

There are however I think some features on the other side and they are that patients and doctors seem to have a repugnance to a rectal examination. Patients do not like it and doctors apparently do not like to do it and so many of these patients do not have early discovery of their lesions.

The other thing is that patients and doctors do not like to submit patients to the expense and the inconvenience of bismuth enemata and that must be overcome. Furthermore we must discount the fact that many of these bismuth enemata are going to prove negative and therefore we must forewarn patients that many of them will prove negative and so we will not suffer the rebound of putting them to the expense of an enema and have them say after it is all over. That was a useless expense. That is the sensitive point in many doctors' minds that often defeats the purpose of early examination.

I think we must do many more bismuth enemata on suspicion expecting the fact that many will be negative if we wish to make early diagnoses.

We have a large series of rectal malignancies. Many of the lesions of carcinomata of the rectum are discrete round lesions on one side and so do not produce symptoms or obstruction and tend to

be latent. When patients have any uncomfortable feeling in the rectum, pass blood, or mucus or when any patients over thirty-five have any alteration in bowel function, they should have a bismuth enema and if there is any suspicion on rectal examination, they should also have a proctoscopic examination, which is simple to do. By proctoscopy and sigmoidoscopy many early lesions are discovered that cannot be discovered by digital examination.

As to this operation for which I am largely responsible I can only say the more we use it, the better we like it, and a number of my friends through the country have used it and like it. I believe it is a very safe procedure. It does two things. It excludes the lesion by segregating into the pelvis the feces-filled segment and establishes the colostomy and most important, it permits the cleansing of the rectum. Occasionally everyone will tear the rectum open in taking a carcinomatous rectum out posteriorly one cannot help it. If the lower segment has been segregated cleansed and irrigated with mercurochrome if it is torn open there will usually not be contamination of the posterior space. A great majority of them done by this plan will heal by first intention and with first intention healing of the posterior part most of the patients can be up and around and leave the hospital in two and one-half weeks.

Compare this with the open posterior wounds that are sloughing and discharging and I think this point has a good deal to do with the mortality. I believe that this plan of segregating the lower segment will definitely cut down the mortality in these cases without in any way limiting the radical extent of the operation.

DR. LELAND S. MCKITTRICK, Boston, Mass. I am very sorry that Dr. Jones isn't here to say a word about a subject in which he has been so intensely interested. No one associated with him as I have been for a period of years could fail to grasp the enthusiasm with which he has worked for these patients or to commend Dr. Lahey and Dr. Cattell for operating upon 62½ per cent of their patients with a mortality of only 13 per cent.

Without question this splendid series of 45 cases without a death is due in part to the procedure which they have developed but I think even more than that to the skill of the surgeons who have done the operations. I fear there may be a tendency to give undue credit to the details of a given operation rather than to certain fundamental principles executed with increasing experience and skill. Doctor Jones makes use of five different operations in meeting the many problems presented by this group of patients. Undoubtedly Dr. Lahey's operation is going to be a valuable addition to our present procedures. I feel quite sure however that there is a group of poor risk patients from causes other than obstruction whose lesion is too high to satisfactorily remove from below after a simple colostomy who will not stand the combined abdominoperineal procedure in one stage and for whom the two-stage operation as developed by Dr. Jones is an excellent one. I should like to stress however that, given the opportunity, an interest in and an understanding of the fundamentals of diagnosis, preparation and operation upon patients with cancer of the rectum are the factors of greatest importance in increasing our operability and decreasing our mortality.

DR. R. B. CATTELL. In patients with complete obstruction due to carcinoma of the rectum it is sometimes necessary to do a loop colostomy. This makes a later abdominoperineal resection of the rectum more difficult due to the necessity of leaving a blind end of bowel distal to the colostomy. We feel that it is inadvisable to leave a blind end with

FIGURES VII IX. RESECTION OF THE RECTUM, SECOND STAGE

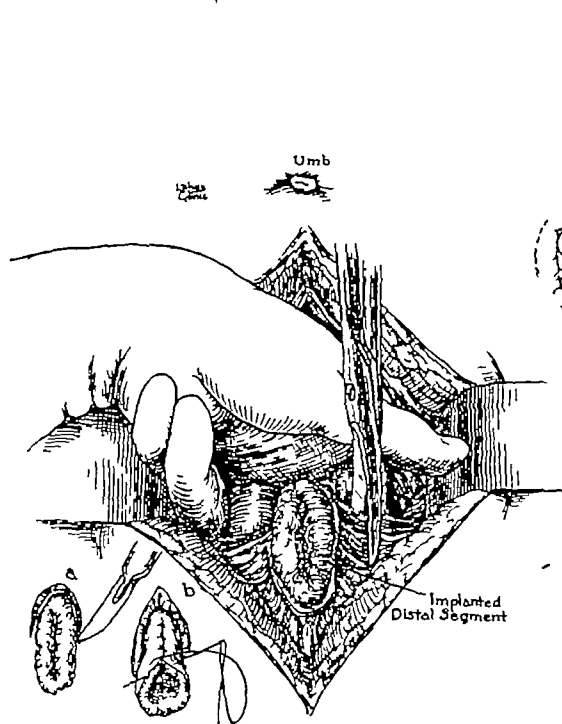


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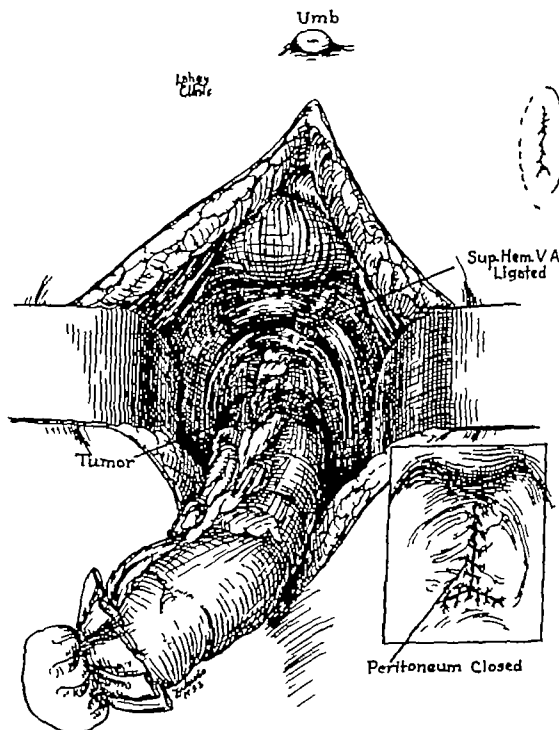


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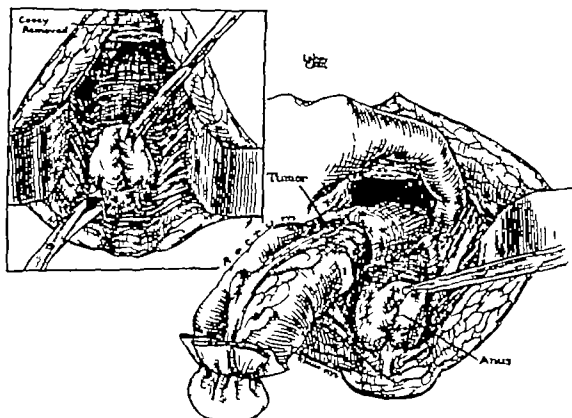


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BLOOD CHART I—CASES I TO VIII

Differential White Cell Count

Case No	Type of Case	R. B. C.* millions per cu. mm.	Hemoglobin (Sahl)† per cent	Color Index	Nucleated R. B. C.‡	Reticulocytes per cent	W. B. C. thousands per cu. mm.	P. M. N.	P. M. E.	P. M. B.	Lymphocytes	Monocytes	Myelocytes	Sickling on stained preparation per cent	Sickling in Wet Preparations				Reversal of Sickle Cells to normal
															At once per cent	4 hrs per cent	12 hrs per cent	24 hrs per cent	
I	Active	16	30	9	9	15	134	49	1	0	37	11	3	2	20	20	30	70	7 days
		13	26	1+	4	33	255	47	0	1	40	2	10	8	20	60	60	80	6 days
		11	21	1+	3	34	236	57	3	1	23	2	14	8	80	100	100	100	7 days
		11	23	1+	4	21	300	67	0	1	20	6	6	6	10	75	100	100	5 days
		87	20	1+	4	15	210	58	0	0	35	0	1	2	100	100	100	100	4 days
		73	18	1+	12	10	320	46	4	2	42	6	0	5	75	100	100	100	21 days
		11	22	1	8	16	180	65	0	1	22	6	6	5	10	50	75	100	3 days
		93	20	1+	8	12	195	71	8	0	20	0	1	5	100	100	100	100	8 days
		74	19	1+	8	26	200	68	2	0	28	2	0	8	50	75	90	90	21 days
		11	27	1+	8	39	220	72	5	0	20	3	0	6	100	100	100	100	6 days
II	Active	16	35	1+	5		360	18	0	0	82	0	0	10	8	25	80	100	15 days
		22	41	10	0	8	420	57	1	2	33	7	0	55	18	40	60	90	5 days
		29	55	0.9	12	11.2	111	36	1	1	55	3	4	58	12	20	60	75	3 days
		30	45	0.7	15	15.0	190	31	1	0	61	5	2	66	25	40	80	100	6 days
III	Active	24	50	1+	75		600												
		32	55	0.8			223												
IV	Latent	38	59	0.7	5	6.0	183	43	4	0	43	10	0	0	20			100	14 days
		46	68	0.7	0	2.0	53	48	3	1	14	3	1	0	0			75	5 days
V	Latent	44	65	0.7	0	3.0	89	63	1	0	30	4	2	0	0			75	4 days
		18	75	0.7	1	2.0	112	40	0	0	51	5	1	0	0			100	6 days
VII	Active	29	60	1+	8	12.0	113	41	5	0	39	12	0	0				100	12 days
		39	45	0.6	3	10.0	120	40	9	1	38	12	0	0	0			100	6 days
VIII	Latent	16	80	0.8	0	0	69	33	4	1	48	14	0	0	0			75	8 days

*The erythrocytes on stained preparations in cases I, II, and III showed moderate to marked anisocytosis and poikilocytosis and slight punctate basophilia. In case VII slight anisocytosis and poikilocytosis.

†100 per cent is equivalent to 15 g of hemoglobin.

‡The figures given in this column represent the number of nucleated red blood cells seen in doing a differential count of two hundred white blood cells.

in the peritoneal cavity. In such instances a sufficient portion of the bowel below the colostomy can be left, which when closed off can be brought out of the operative incision and anchored to the peritoneum. This area can be drained drawing the muscles and fascia over it. It is for the same reason in doing an anterior or abdominal resection where

a stump of the rectum is left in a blind sacral cavity that we think it very important to put a perineal drain up to the stump to take care of possible infection. With the avoidance of direct suture of the colon and withdrawal of blind ends from the peritoneal cavity, peritonitis should be a rare complication.

SICKLE CELL ANEMIA*

A Report of Eight Cases, One With Necropsy

BY JOHN C. CORRIGAN, M.D.,† AND IRVING W. SCHILLER, M.D.†

SICKLE cell anemia, so far as we know, has not been the subject of a report from New England. In the past year, eight cases of this disease have been observed in the Boston City Hospital. This blood dyscrasia may present protean manifestations and has been known to masquerade under such diagnoses as rheumatic fever, tuberculosis, acute appendicitis, syphilis, and obscure anemias. Because these conditions are seen daily by clinicians, we feel that attention may properly be called to sickle cell anemia as worthy of consideration in the differential diagnosis of the more perplexing cases. In a few of these patients a simple blood examination may establish the diagnosis and save a large number of elaborate laboratory procedures. A drop of the patient's blood drawn on a cover slip and inverted on a glass slide and sealed with vaseline may demonstrate the alteration in the shape of the red cells known as "sickling."

In 1910 James B. Herrick¹ reported a case because of unusual blood findings in which "the shape of the reds was very irregular, but what attracted attention was the large number of elongated sickle-shape and crescent-shape forms." During the next thirteen years three similar cases with sickled erythrocytes were described in the literature by Washburn², Cook and Meyer³, Emmel¹⁰ and Mason⁴, and to this last observer we owe the term "Sickle Cell Anemia." It was not until 1923 when two papers were published by Sydenstricker et al⁵ and Huck⁶ that attention was called to the importance of the condition, and established sickle cell anemia as a definite disease entity. Since this time an increasing number of noteworthy articles and case reports have appeared in the literature.^{7 8 9 10 30 31 32 34}

The term "Sickle Cell Anemia" has been used in a very broad sense to include, not only those individuals who have evidence of the disease, but also a larger group of individuals apparently in good health who present no abnormality other than the phenomenon of sickling under certain conditions. About seven per cent of all Negroes fall into this group.^{11 12 13} We

prefer to designate this latter group as having the "Sickle Cell Trait" or "Sicklelema," and reserve "Sickle Cell Anemia" for those with definite evidence of the disease either in the latent or active form.

This report is concerned with eight cases of sickle cell anemia.* The clinical notes on these patients are given in the following case reports. The blood studies are summarized in chart I. On the basis of these and the other cases previously reported a discussion of the disease is given.

CASE REPORTS

CASE I. A 23-year-old colored female was admitted to a Surgical Service for excision and drainage of an abscess over the sternum of four months' duration. So far as she could recall she had always been in poor health. She had been subject to frequent chest colds and had had numerous attacks of muscle and joint pains. She had had chronic leg ulcers over a period of four years. On admission to the hospital, the abscess was incised and creamy pus obtained. She was first seen by us because of anemia and cardiac condition and she was transferred to the Third Medical Service.

The patient had always been cared for by her aunt, and attempts at obtaining an accurate family history were always unsuccessful. Known contact with tuberculosis was denied. "All diseases which she suffered in childhood were very severe." She had no operations or injuries. Catamenia had always been irregular since onset at 19 years.

Examination disclosed poor general development and marked malnutrition. The breasts were underdeveloped, and pubic hair almost absent. She showed distinct pallor most marked in conjunctivae and mucous membranes. Her sclerae were of greenish yellow tinge. The tonsils were moderately enlarged. The chest was emphysematous and both lungs showed areas of consolidation scattered through the bases, with many fine moist rales throughout the patches. The apices were clear. The heart was enlarged to the left and right. A loud blowing systolic murmur was heard at the apex and the pulmonic second sound was abnormally accentuated. There were two large incisions over the sternal abscess, through which purulent material was draining. The liver extended three fingerbreadths below the margin of the ribs. The spleen could not be felt. External genitalia were infantile in character and the uterus was very small. A large ulcer was present over the lower portion of the right leg, and there were two large ulcers over the malleoli of the left leg. There was lymphadenopathy in the cervical, epitrochlear, and inguinal regions.

Laboratory. Blood smear (Wright's stain) showed

*From the First and Third Medical Services (Tufts) of the Boston City Hospital and the Department of Medicine Tufts Medical School.

†Corrigan John C.—Resident Physician First and Third Medical Services Boston City Hospital. Schiller Irving W.—Resident Physician First and Third Medical Services Boston City Hospital. For records and addresses of authors see "This Week's Issue" page 427.

*The patients in our series who showed only the sickle cell trait will be included in a subsequent communication.

erate hypertrophy of both ventricles. Extensive caseous tuberculosis involved the mediastinal, hilus, aortic, mesenteric, and pelvic lymph nodes. Numerous caseous nodules were scattered throughout the lungs. A few were found in the kidney. A large retroperitoneal tuberculous abscess was located anterior to the sacrum with involvement of the fifth lumbar and first sacral vertebra and the intervening disc. Tuberculous ulcers were found in the ileum with small tubercles scattered over their serosal surfaces.

The spleen greatly reduced in size, weighed only 0.87 grams, and had a pale, wrinkled, greyish white surface. The splenic artery diminished progressively in size, with thickening of the wall and narrowing of the lumen, as it approached the hilus of the spleen. On sectioning the spleen, many small foci of calcification were encountered. The surface had a pale, brownish grey, fibrous appearance and normal markings were absent.

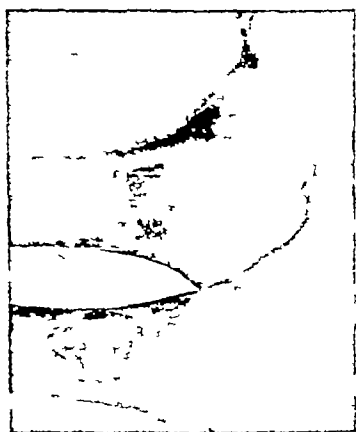


FIGURE 4 (Case 1) Leg ulcers

The kidneys were congested.

The vertebrae, sternum, ribs and femur showed thinning of the cortex and trabeculae. The marrow of all these bones was dark red.

The other organs and tissues were negative.

The positive microscopic findings were as follows:

Tuberculosis was found in the liver, bone marrow and sinus tract in the chest wall in addition to the areas described grossly. The skin ulcers showed a non-specific inflammatory process.

The capsule of the spleen was wrinkled. The parenchyma was composed of many trabeculae crowded together with a small amount of connective tissue between them. There were scattered areas of calcification in the capsule and trabeculae. The intima of the small arteries was thickened with narrowing of their lumina. No splenic pulp or Malpighian corpuscles were present.

The liver showed extensive sclerosis of the central areas. The sinusoids were distended by sickled red cells.

In the kidney the glomerular capillaries were distended by red cells.

There was marked intimal thickening and extensive sclerosis of the media of the aorta, suggesting syphilis.

The bone marrow was very hyperplastic. There were numerous islands of stem cells. Erythropoiesis was marked. Many erythroblasts, normoblasts, a great many nucleated red cells and sickled cells were present. Frequent mitotic figures were found. A number of nucleated red cells appeared sickled.

Scattered islands of active white cell formation occurred.

The liver cells and macrophages in the liver, lymph nodes and bone marrow contained hemosiderin. Large amounts of hemosiderin were present in the epithelial tubule cells of the kidney. A very pale, yellowish green to pinkish brown, highly refractile, granular material was found in many liver cells and in numerous macrophages in the liver, lymph nodes and bone marrow.

Large macrophages filled with sickled red cells were found in the sinusoids of the liver and in the sinusoids of several lymph nodes. They were also found in the bone marrow.

CASE II. A two-year-old colored female was admitted to the Pediatric Service because of failure to gain weight for four months, and diarrhea of one week's duration.

Mother and father were living and well, two brothers living and well, one sister age six months, had been "sickly" almost since birth.

Physical examination revealed an extremely dehydrated and listless colored female child, unusually small for her age. The head was normal in size and shape. The fontanelles were closed and there was no craniotabes. There was no evidence of scleral jaundice. There was a slight mucopurulent discharge from the nose, and both ears were discharging thick yellow pus. The lips were dry. The teeth were normal. The tongue was coated, and the throat was moderately injected. The tonsils were hypertrophied and injected. The lungs were clear, and the heart was negative. The spleen and liver were not palpable. There were no scars or ulcerations of the extremities. The reflexes reacted sluggishly.

On admission she was found to have bilateral bronchopneumonia which subsided after several weeks. Following this she continued to run a low-grade temperature for five weeks which was attributed to the bilateral otitis media.

The blood smear (Wright's Stain) showed sickle-shaped erythrocytes. Other blood studies are shown on chart I. The urines showed strong test for urobilin, but were otherwise negative. Van den Bergh was positive in the indirect phase. Kahn was negative. The Mantoux test was negative. The red blood corpuscles showed slightly increased fragility to varying strengths of saline solutions.

While in the hospital the patient received orange juice, cod liver oil and iron and ammonium citrate 3 grams daily. While under this treatment she picked up considerably and was discharged after three months to the Out Patient Department.

CASE III. A seven year old colored male was referred to the South Department for Contagious Diseases Service of Dr. Edwin H. Place with a diagnosis of pertussis. He had been staying at the time of admission at a convalescent home following discharge from a local hospital where a diagnosis of sickle cell anemia was made. Family history was not significant. Parents stated that he had always been in poor health. At the age of three years he was operated on because of abdominal pain simulating appendicitis and a normal appendix was removed. At that time he also had joint pains. During the next three years he was readmitted on two occasions with the diagnosis of rheumatic heart disease and adenotonsillectomy performed at the second admission.

Several months before his present entry he was brought back to the hospital because of loss of weight, fever, convulsions, irritability and pains in knees and elbows. Examination at that time disclosed a well-developed, poorly nourished Negro boy, appearing acutely ill. Respirations were rapid and

sickle-shaped erythrocytes. The other blood findings are given in abstract in chart I. Additional laboratory data are as follows: icteric index 35 to 38, van den Bergh positive in the indirect phase, bilirubin 1.8 mgm per 100 cc, blood nonprotein nitrogen 33 to 38 mgm per 100 cc, total plasma protein 6.8 Gm per 100 cc, blood calcium 7.8 mgm per 100 cc, blood phosphorus 4.5 mgm per 100 cc. Bleeding and clotting time were normal. Fragility test of erythrocytes was normal on one occasion and later

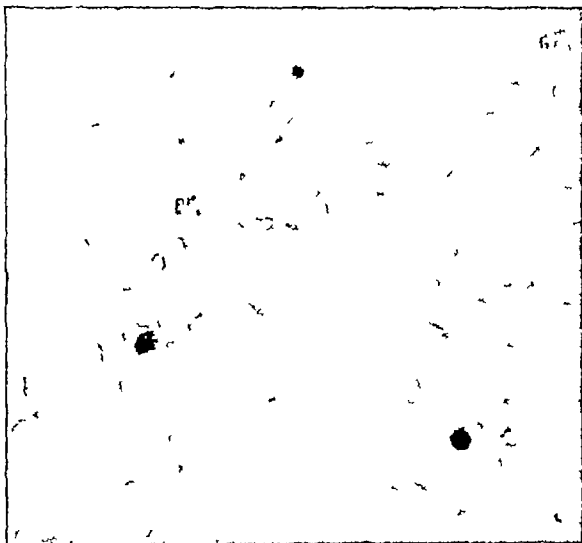


FIGURE 1* (Case I) Stained blood preparation (Wright's stain)

increased. Eight blood cultures were negative. Urinalyses always showed heavy trace of albumin, few white cells, and an occasional red cell and granular cast. Urobilin test on urine was strongly



FIGURE 2 (Case I) Moist blood preparation photomicrograph taken after standing twenty-four hours at room temperature showing 100 per cent sickling

positive. Gastric analysis showed no free hydrochloric acid one hour after histamine stimulation. Serological tests (patient febrile) Kahn positive three times, Hinton doubtful once, positive twice, Wassermann negative. X-rays of chest showed consolidation in lungs, cardiac enlargement, periostitis of bone beneath leg ulcer, general bone atrophy and trabeculation characteristic of sickle cell anemia. Dark field examination of ulcers negative. Biopsy by Dr. Harold E. MacMahon showed nonspecific chronic inflammatory tissue. Electrocardiogram was within normal limits.

*We are indebted to Raymond Yeaton, M.S., Tufts College for the photomicrograph.

Progress. Her course on the ward was characterized by marked diurnal swings in temperature and progressive emaciation until death during the eighth week. At times there was cooing from the gums and epistaxis. She complained of pains in her knees and ankles. On three occasions there were severe abdominal crises in which vomiting was the most striking feature. Examination of the abdomen at these times showed slight generalized tenderness but no spasm. The liver remained palpable throughout, but the spleen was never felt. The ulcer over the sternum became chronic, but x-rays of the sternum and probing failed to give any evidence of osteomyelitis. Her lungs became generally involved with patches of consolidation and coalescence at the bases. A non-productive cough was frequently troublesome. Two weeks before death she had a generalized convulsion, but there were no subsequent neurological signs.

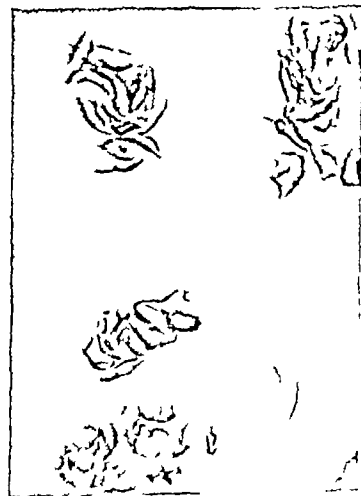


FIGURE 3 (Case I) Moist blood preparations showing clumping of sickled cells, a phenomenon frequently observed

Therapy. Patient received four blood transfusions. Twenty-one consecutive daily injections of liver extract 343 (N.N.R.) intramuscularly showed no alteration in her blood picture. She was given iron and ammonium citrate 8-12 Gm daily for a long period. Spleen extract (Armour)* and bone medullary extract (Armour)* were apparently ineffective. High vitamin and high mineral diet with profuse quantities of accessory vitamins A, B, C, D, and E were given in the form of Haliver oil, Vegex, fruit juice, etc. She also received ultraviolet radiation, but none of these procedures produced any change in the x-rays or alterations in her blood calcium studies.

During the last week she was profoundly weak, and slowly drifted off to death.

POSTMORTEM EXAMINATION†

By William H. Holtham, M.D.,
Department of Pathology, Boston City Hospital

The autopsy was performed 15 hours after death. The body was poorly developed and extremely emaciated. A small sinus, situated over the third intercostal space, just to the right of the sternum, was draining thick, purulent material. Large superficial ulcers of the skin were present over the ankles.

The heart weighed 360 grams and showed mod-

*We wish to thank Armour and Co. for supplying this material.

†Abstract of necropsy findings further studies with photomicrographs to be reported in detail in subsequent communication.

tempts at confirming these observations the results have been inconstant. A factor to be considered in the interpretation of these results is the variation that occurs in the percentage of sickling in immediate moist preparations made under similar conditions. Graham and McCarty¹¹ failed to find an increase in the percentage of sickle cells twenty-seven hours after death in their heart's blood specimen, taken under anaerobic conditions. It appears that further study of the influence of oxygen tension *in vivo* should be pursued.^{23, 24}

SYMPTOMATOLOGY

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The leg ulcers show non-specific inflammatory changes.

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Individuals with the sickle cell trait or latent sickle cell anemia may show no abnormal blood findings other than the presence of sickled erythrocytes. The sickle cells may be recognized accidentally in a counting chamber preparation during a routine erythrocyte count.

The active cases usually show hemoglobin values varying from 30 to 60 per cent (Sahlb)

slightly labored. Mucous membranes were very pale, the neck was found to be slightly resistant on anterior posterior flexion. His heart percussed 15 cm. outside the nipple line, and a loud blowing systolic murmur was present, heard best at the apex. The lungs showed questionable diminished breath sounds over the entire upper chest. The abdomen was very tense, with moderate tenderness in the right upper quadrant. The liver was not felt, the spleen was hard and extended one fingerbreadth below the costal margin. There was generalized shotty lymphadenopathy.

Blood studies showed sickle-shaped erythrocytes. The other blood findings are shown on chart I (The first two readings have been taken from his previous hospital entry). Urine showed slightest possible trace of albumin. Tuberculin test 1:1000 was negative. Blood Wassermann was positive on two occasions (fever), doubtful on another, Hinton negative on two occasions. X-ray films of the heart showed shadow larger than normal.

The patient showed gradual improvement and at the time of discharge it was felt that sickle cell anemia accounted for his symptomatology.

On admission to this hospital his condition was fairly good and there was no essential change in his blood picture. The spleen reached 3 cm. below the costal margin. There was no cardiac enlargement but because of pathological accentuation of the pulmonary second sound and a moderately loud blowing systolic murmur, the question was again raised as to whether a diagnosis of rheumatic heart disease should be made in addition to sickle cell anemia.

CASE IV. A twenty-seven-year-old married colored female mother of cases II, V, VI, and VII. She was one of fourteen children who are living and well. Father has had "asthma" for many years. Her husband's father died of "unknown disease" which she thinks was "anemia." She complained of weakness, occasional attacks of abdominal pain, generalized joint pains without local signs and paresthesias of the legs. Fresh blood preparations showed 75 per cent sickling after twenty-four hours.

CASE V. A seven-year-old colored male who was admitted to the South Department, Service of Dr. Edwin H. Place, with varicella. Diet included adequate vitamin intake. First dentition appeared at fifteen months. He was always underweight, apathetic and "never cared to play." Adenotonsillectomy was done in the past because of frequent head colds. Has been subject to violent attacks of vomiting followed by abdominal pains. Has had indolent ulcers which left scars about both elbows, and periods of yellow discoloration of the sclerae. Fresh blood preparations showed 75 per cent sickling after twenty-four hours.

CASE VI. A four-year-old colored male who was admitted to the South Department, Service of Dr. Edwin H. Place with varicella. Adenotonsillectomy was done because of frequent colds. He has had periods of yellow discoloration of the sclerae, indolent ulcers with residual scars about the elbows, and at times he has cried for several days, although the mother could not elicit any definite complaints. He has also had numerous attacks of abdominal pain and vomiting of two to three days duration. Fresh blood preparations showed 2 per cent sickling at once and a progression to 100 per cent after twenty-four hours.

CASE VII. A six-month-old colored female. She was delivered normally at full term, was breast-fed one month and then formula-fed with adequate amounts of cod liver oil and orange juice. She has

been treated for "bronchitis" since three weeks of age. Her mother stated that the child did not appear to develop normally since the third month. When seen by us she had bilateral otitis media, rhinitis and acute bronchitis. Fresh blood preparations showed 4 per cent to 2 per cent sickling at once and 100 per cent after twenty-four hours.

CASE VIII. A thirteen-year-old colored male complaining of joint pains of four months' duration. He had appendectomy two years ago and a normal appendix was removed. Has had similar attacks of joint pains in the past, periods of chronic productive cough. Fresh blood preparations showed 75 per cent sickling in twenty-four hours.

INCIDENCE

The hereditary characteristic of the disease was established by Huck.⁸ It is a disease which occurs in young people. The average age in our series is ten years, the youngest six months, and the oldest twenty-seven years. Although our cases show an even sex distribution, in the reported cases males are affected more than females in the ratio of two to one. The cases we are reporting occurred in Negroes, a finding which agrees with the usual race incidence. It must be indicated, however, that the existence of this condition outside the Negro race has definitely been established.^{9 14 15 16 17 18}

THEORIES OF FORMATION OF SICKLE CELLS

Investigators of this subject have offered many theories as to the causation of the sickling phenomenon but at this time none of the explanations has met with universal acceptance. The presence of nucleated sickle cells, both in the bone marrow and circulating blood, has been established.²⁰ (Cf. Case I), which suggests that the operative forces that influence the change in the shape of the red cell are equally active in both locations.

Hahn and Gillespie²¹ in a series of experiments in which they introduced various gases (carbon dioxide, nitrous oxide, and hydrogen) into fresh blood preparations of persons with the sickle cell trait, found that they were able, in this manner, to transform the cells in these preparations into sickle-shaped erythrocytes. The sickle distortion they found to be a reversible phenomenon, oxygen or carbon monoxide could induce restoration to the discoid form. They offer the hypothesis that sickle cell formation in vivo is probably induced also by anoxemia and they believe that disease of the heart and lungs, which is commonly present in this condition, plays an important rôle. Sydenstricker²² states that he found that the true sickle cells in the blood of an active case are absolutely unaffected by oxygen.

Seriver and Waugh²³ demonstrated in vivo a direct proportion between decreased oxygen tension and the degree of sickling they produced. They produced circulatory changes in the arm by alternating the application of an Esmarch bandage with stimulation by heat and massage. In our at-

tempts at confirming these observations the results have been inconstant. A factor to be considered in the interpretation of these results is the variation that occurs in the percentage of sickling in immediate moist preparations made under similar conditions. Graham and McCarty¹¹ failed to find an increase in the percentage of sickle cells twenty-seven hours after death in their heart's blood specimen, taken under anaerobic conditions. It appears that further study of the influence of oxygen tension *in vivo* should be pursued.^{23, 24}

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and a red cell count of 15 to 35 million per cu. mm with a normal or elevated color index. In the very severe cases, the red blood count may drop to one million or less, and the hemoglobin to about 10 per cent. The white cell count ranges from 10,000 to 20,000 per cu. mm and those with intercurrent infections may show from 30,000 to 50,000 per cu. mm. The differential leucocyte count is not distinctive. At times an increase in the eosinophiles may occur, and myelocytes form the larger percentage of abnormal white cells present. Anisocytosis and poikilocytosis are usually moderate in degree, there is moderate polychromatophilia, punctate basophilia is the rule. Nucleated red cells are found, and in one of our cases (case II) 01 per cent of total red blood cells was seen to be nucleated that is, the number of nucleated red blood cells was approximately equal to the number of leucocytes on stained smear. The percentage of sickle cells in the stained preparation varies from 0.5 to 5 per cent or more, depending on the severity of the anemia. Phagocytosis of the red cells by large mononuclear leucocytes is seen in both stained and fresh blood preparations. This phenomenon is stressed by many writers, but we were impressed by the infrequency with which we observed it in the blood of our cases. Reticulocytes are found to be increased. Case II showed on one occasion as high as 56 per cent. Case I showed constantly 30 to 40 per cent with higher percentages on many occasions. The platelets are normal or slightly increased. The fragility of the red blood cells in the active cases is normal or slightly increased to varying strengths of saline solutions. The coagulation and bleeding times are normal. The van den Bergh test is almost always positive in the indirect phase. Blood cultures are negative. Gastric achlorhydria is usually present. The urine shows low fixed specific gravity, large twenty-four hour amount, reduced excretion of phenolsulphonphthalein and generally the presence of albumin in small amounts. Urobilin is constantly present in active cases.

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Splenectomy is reported to be beneficial in the patients who present splenic enlargement.^{15 16 21 31 33 35 36} In the reported cases, more than half showed freedom from symptoms and some improvement in the general blood picture, but the sickle cell trait remained unchanged.

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2 The literature on sickle cell anemia has been reviewed, the appearance of the disease in New England is noted for the first time.

3 Three cases of sickle cell anemia are reported in detail, one with necropsy, and notes on five cases are recorded.

4 The recognition of the sickle cells in fresh

blood preparations is a simple laboratory procedure

5 Sickle cell anemia may masquerade under such diagnoses as rheumatic fever, tuberculosis, acute abdominal conditions, syphilis, and obscure anemias. The high percentage of Negroes among those with this disease warrants the study of fresh blood preparations when such diagnoses are considered in patients of this race.

6 The existence of sickle cell anemia has been established outside the Negro race, and should be considered in all perplexing blood problems.

7 The histological findings in the spleen, liver, and the marked bone marrow hyperplasia are the prominent pathological findings, the 0.870 gram spleen found in case I appears to be the smallest on record.

ACKNOWLEDGMENT

We wish to express our appreciation to Dr. Cadis Phipps and Dr. Ralph C. Larrabee for their assistance to Dr. Edwin H. Place for his kind permission to report the cases from his department, to Dr. Frederic J. Parker Jr., and Dr. William H. Holtham of the Department of Pathology, and Dr. Jacob Wallace, Resident in Pediatrics for their cooperation.

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INCIDENCE OF SYPHILIS IN THE GENERAL POPULATION AND A COMPARISON OF THE KAHN AND WASSERMANN TESTS*

BY JAMES J. SHORT, M.D.,† AND MARGARET F. KELLEY, M.A.‡

THE incidence of syphilis in the general population is a much discussed and mooted question. Many estimates have been made in former years based often on small and inadequate statistics. In recent years a number of attempts have been made by health departments and by individual physicians to broaden the scope of the inquiry and obtain more adequate and accurate data. Kiser and Bohner in a recent article¹ summarized much of the current

literature on the subject and gave their own findings on the incidence of syphilis in private practice in 2,872 consecutive examinations made from September 1, 1925 to January 1, 1932. Table 1 contains a re-statement of their summary together with their own observations.

A study of the figures shows that the incidence of syphilis varies with the age and type of group studied. A group of young adult college students, presumably above the average in intellect and social position, shows an incidence of only 0.2 per cent while a group of military recruits probably only a few years older on the average but drawn from the general white population shows an incidence of 10.5 per cent. It is generally conceded that syphilis is consider-

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and a red cell count of 15 to 35 million per cu mm with a normal or elevated color index. In the very severe cases, the red blood count may drop to one million or less and the hemoglobin to about 10 per cent. The white cell count ranges from 10,000 to 20,000 per cu mm and those with intercurrent infections may show from 30,000 to 50,000 per cu mm. The differential leucocyte count is not distinctive. At times an increase in the eosinophiles may occur, and myelocytes form the larger percentage of abnormal white cells present. Anisocytosis and poikilocytosis are usually moderate in degree, there is moderate polychromatophilia, punctate basophilia is the rule. Nucleated red cells are found, and in one of our cases (case II) 01 per cent of total red blood cells was seen to be nucleated that is, the number of nucleated red blood cells was approximately equal to the number of leucocytes on stained smear. The percentage of sickle cells in the stained preparation varies from 0.5 to 5 per cent or more depending on the severity of the anemia. Phagocytosis of the red cells by large mononuclear leucocytes is seen in both stained and fresh blood preparations. This phenomenon is stressed by many writers, but we were impressed by the infrequency with which we observed it in the blood of our cases. Reticulocytes are found to be increased. Case II showed on one occasion as high as 56 per cent. Case I showed constantly 30 to 40 per cent with higher percentages on many occasions. The platelets are normal or slightly increased. The fragility of the red blood cells in the active cases is normal or slightly increased to varying strengths of saline solutions. The coagulation and bleeding times are normal. The van den Bergh test is almost always positive in the indirect phase. Blood cultures are negative. Gastric achlorhydria is usually present. The urine shows low fixed specific gravity, large twenty-four hour amount, reduced excretion of phenolsulphonphthalein and generally the presence of albumin in small amounts. Urobilin is constantly present in active cases.

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3. Three cases of sickle cell anemia are reported in detail, one with necropsy, and notes on five cases are recorded.
4. The recognition of the sickle cells in fresh

mann tests Of these 205, 22 or 0.22 per cent had positive laboratory tests as the only evidence of syphilis In other words, in 22 cases the condition would have been entirely overlooked if the tests had not been a routine measure

Routine Kahn tests were also made in 1932 on bloods in a group of 1000 insurance policy holders of both sexes The number of definitely positive Kahns was found to be 18 or 1.8 per cent.

The "Unlimited" group of 700 comprised subscribers to a service which included as a routine measure nearly all tests commonly used in the study of an individual's physical condition but most of which are ordinarily recommended only when there is some special indication in the history or physical condition This group could be included with the "Standard" group but is listed separately because the service is

It will be seen from the table that there was complete agreement in 92.6 per cent of 1714

TABLE 3
COMPARISON OF KAHN AND WASSERMANN REACTIONS

	Number	Per Cent
Agreeing Negatives	1390	81.1
Agreeing Positives	178	10.3
Agreeing Doubtfuls	21	1.2
Wass Pos—Kahn Dbt.	23	1.3
Wass Pos—Kahn Neg	22	1.3
Wass Dbt.—Kahn Neg	40	2.4
Kahn Pos—Wass Dbt.	21	1.2
Kahn Pos—Wass Neg	6	.4
Kahn Dbt—Wass Neg	13	.8
	1714	100.0

cases in which comparisons were made Slightly differing results were obtained in 9.7 or 5.7 per

TABLE 2
INCIDENCE OF SYPHILIS IN VARIOUS GROUPS

Test Employed	Cases Selection	Groups	Number of Cases	Positive Reactions		Doubtful Reactions		Negative Reactions		Period	Date
				No	%	No	%	No	%		
Kahn	Routine	Stand.	9983	205*	2.06	68	0.69	9708	97.25	1 year	1928
Kahn	"	Insur	1000	18	1.80	22	2.2	960	96.0	3 mos	1932
Wass	"	Unlim.	700	16	2.28	15	2.14	669	95.6	3 years	1929 1930, 1931
Wass	Clinical	All	1637	145	8.85	78	4.6	1413	86.3	1 year	1928

*In 22 of these cases or 0.22 per cent the positive test (confirmed by Wassermann) was the only positive finding

more expensive and individuals who subscribe to it are presumably in better economic status than the average It will be noted that in this group were 16 or 2.28 per cent who gave definitely positive Wassermann reactions (confirmed by Kahns)

The figures in the fourth group of 1637 comprising all services are especially interesting, as the effect of clinical selection on the incidence of positive reactions is seen at once Thus 145 or 8.85 per cent showed positive Wassermanns confirmed by Kahns These figures should be considerably higher as many cases having histories or physical signs suggesting syphilis were advised to have a Wassermann test but refused to do so since they were to receive a Kahn test as a routine part of their service The figures obtained in this group are of course of no particular value in the study, since the primary purpose here is to determine the incidence of syphilis in the population as a whole Of the preceding three groups containing 11,683 individuals, 239 were positive, a percentage incidence of 2.04

Table 3 contains a comparison of the Kahn and Wassermann tests Our results confirm the generally accepted view that the Kahn test is a very reliable procedure for the detection of syphilis and that it gives results highly comparable to the Wassermann test

cent Completely differing results were found in 28 cases or 1.7 per cent Of the latter the Wassermann test was positive and the Kahn negative in 22 cases or 1.3 per cent and the Kahn positive and the Wassermann negative in 6 or 0.4 per cent From this comparison we feel that a combination of the two tests gives about as satisfactory laboratory data as can be obtained in the diagnosis of syphilis

SUMMARY

A study of the incidence of syphilis in the general population has been made by the use of Kahn and Wassermann tests in a total of 13,320 cases drawn largely from the more responsible white portion of the population in and around New York The holding of life insurance and the taking of periodic "health examinations" are considered as evidences of stability and responsibility A few of the difficulties inherent in the problem of obtaining reliable information as to the incidence of syphilis in the population of this country as a whole are pointed out A comparison of the Kahn and Wassermann tests has been included

CONCLUSIONS

1. Approximately two per cent of the general average of the more responsible white popula-

ably more prevalent among the colored population of this country and the view is supported by the figures of Levin¹⁰ The estimated incidence in the general population given by the United States Public Health Service and the New York State Department of Health is notably lower than from other sources, incomplete reporting is usually mentioned as the reason for the low figures In a recent statement from the Department of Health of New York City¹⁴ the incidence of syphilis in the population of six million for upstate New York is assumed to be

per cent Probably the fact, as they state, that these were drawn from a well-to-do and middle class population accounts for the rather low findings, offsetting the elevating influence of illness An established stable citizenry would be expected to furnish fewer cases than a group which included derelicts and floaters

A consideration of some of these factors and influences indicates slightly the difficulties inherent in any study to determine the incidence of syphilis in the population as a whole With the hope of adding a few more figures carefully

TABLE 1
RECENT REPORTS OF INCIDENCE OF SYPHILIS

Source of Information	Class Studied	Number of Cases in Study	Per Cent Positive	Remarks
Univ of Minnesota ¹	College Students	5,000	0.2	
U S Pub H. Serv. ²	General Population		0.163	
New York State Dept. Health ⁴	General Population Upstate New York		0.27	Based on information from physicians, clinics and hospitals
Snow and Brunet ⁵ Stevens ⁶ Lynch ⁷	General Population		10.15	Estimated
Hazen ⁸	Males in United States		10.00	Estimated
Neisser ⁹	Population in Berlin		12.00	Estimated
Fournier ¹⁰	Population in Paris		15.00	Estimated
Levin ¹¹	{ White Military Recruits Negro Military Recruits }	10,000	{ 10.5 18.3 }	Based on Wassermann tests. Based on Wassermann tests
Browning ¹²	Dispensary Children		14.0	
Fox ¹³	{ Hospital—White Hospital—Negro }		{ 12.0 14.0 }	
Machaeras ¹⁴	Dermatologic Clinic, Munich		9.67	For year 1926
Kiser and Bohner ¹⁵	{ Male—White Female—White Both sexes—White }	{ 1,084 1,788 2,872 }	{ 6.08 2.18 3.65 }	Private practice September 1, 1925, to January 1, 1932

ten per cent and it is felt that to estimate ten per cent of the adults as infected would be conservative These figures are arrived at in part by taking into consideration an annual attack rate of approximately 0.44 per cent of the population and assuming the average expectation of life for these victims to be 40 years

The influence of locality with the tendency of definite racial groups of varying social standards, education and culture, to colonize or segregate in certain areas, must be taken into consideration in any attempt to arrive at final conclusions as to the general incidence of syphilis The average health status of any group selected for study also will have a profound influence upon the final result For instance, cases from a doctor's practice are presumably sick people and are prone to show higher figures than the general average of the population It is somewhat surprising that the general incidence for Kiser and Bohner's 2,872 cases was only 3.65

obtained to those already bearing on this problem we are presenting the results of laboratory studies on a total of some 13,000 cases drawn chiefly from the general run of stable white citizens during the past few years in and around New York. A summary of our findings is shown in table 2

These figures show the results of blood tests on 13,320 individuals by either the Kahn or Wassermann method, or by both methods The first or "Standard" group consists largely of people in fairly good health who applied for a health examination The Kahn test was done routinely in this group of nearly 10,000, largely to determine the incidence of syphilis in this group and to learn if syphilis was being often overlooked when history and physical signs were made the basis for recommending a laboratory test for syphilis Two hundred and five or 2.06 per cent of this group had definitely positive Kahn tests which were confirmed by Wasser-

no evidence of malignancy in this region. Stomach elsewhere was smoothly outlined with good peristalsis. Duodenal cap was definitely irregular as previously noted. Impression Cardiospasm—Duodenal Ulcer'

On the same day I made this note 'The symptoms are not typical but suggest a carcinoma more than cardiospasm. There is nothing in the x-ray or history to suggest that the obstruction ever becomes complete which occurs with a true cardiospasm. If this is spasm, it is not of the kind that we speak of as cardiospasm. I believe this patient warrants an exploration with an opening into the fundus to rule out malignancy. If no malignancy be found the cardia could be dilated through the incision. It is only by this method that we can possibly hope to get carcinoma of the oesophagus early enough to accomplish a radical cure.'

An exploratory operation revealed a carcinoma in the region of the cardia. From this point it extended along the lesser curvature for a distance of two inches and along the oesophagus for a distance of one to one and one-half inches. It adhered to the posterior abdominal wall so that a complete removal was impossible.

Here is a case, then, of an elderly man who develops oesophageal symptoms. His description of the first attack suggests a spasm of the upper third. One would naturally look first for some nervous or reflex disorder to explain this mechanism but a carcinoma of the stomach should also be kept in mind, for occasionally it produces an oesophageal spasm as the first symptom. This patient also volunteered the information that the food descended very slowly, which does not occur with the usual kinds of oesophageal spasm. As time went on the story became increasingly suggestive of carcinoma. The symptoms were persistent and increasingly severe. The patient should have had the benefit of oesophagoscopy and further roentgenologic studies sooner than he did. It is difficult to say just when an exploratory operation was justifiable but certainly it should have been done following the x-ray of April which showed evidence of obstruction. The symptoms by this time were characteristic enough for some disease other than cardiospasm to justify ignoring the roentgenologic diagnosis. An operation at

this time would have decreased the period of observation by three months or just one-half. If x-rays had been taken every month it is possible that this interval of time could have been shortened still further.

The failure to make an earlier diagnosis in this patient was the result of placing too much reliance on the x-ray or inattention to the story, or both. One cannot emphasize too strongly the importance of a careful history in gastro-intestinal conditions. Interest in the patient's story has declined with the increased use of the x-ray, so that inadequate attention to the history is, today, the most frequent cause of the mistakes made in the diagnosis of gastro-intestinal diseases. The house officer obtained an excellent history from this patient. The failure to act upon it resulted either from an inability to interpret its significance or such implicit confidence in the x-ray that the story was ignored.

SUMMARY

Another case of carcinoma beginning around the cardia is reported to emphasize the following points in diagnosis:

1. Indefinite oesophageal symptoms, of which the etiology is not clear, should always be investigated by the x-ray and the oesophagoscope.

2. A persistence of the symptoms requires that roentgenological studies be employed as frequently as once a month until a diagnosis has been made.

3. Cases in which the x-ray suggests the presence of a cardiospasm but the history is more compatible with a carcinoma should be explored.

4. An exploratory operation is also indicated for patients who have a typical history of carcinoma although the roentgenologic and oesophagoscopic examinations are negative.

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A NEW METHOD FOR THE PREDICTION OF THE SEX OF THE FETUS*

BY MAX DAVIS, M.D.†

GREAT interest in the sex of the unborn child has probably been manifested since the first couple realized that they were about to become proud parents. Although such foreknowledge, except in the unusual cases where it might be of some legal consequence, would merely satisfy curiosity, nevertheless it would give great pleas-

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ure to some families and would perhaps lessen the disappointment of others at the time of the birth of the child.

Various attempts, such as serum reactions and the counting of the fetal heart rate have been made to elicit this information, but no one of them has been at all successful. Recently¹ a hormone reaction has been reported which gave an accuracy of 94% in 85 cases. This reaction consisted of injecting rabbits, fully three months old, whose testicles were in the inguinal

tion in and around New York show laboratory evidence of syphilis

2 Race, locality, customs, age and occupation are modifying influences in the study of this problem.

3 A comparison of the Kahn and Wassermann tests in 1714 cases showed excellent agreement.

4 A combination of both tests gives as good laboratory and as can be secured in the diagnosis of syphilis

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THE RELATIVE VALUE OF SYMPTOMS VERSUS THE X-RAY AND OESOPHAGOSCOPE IN THE EARLY DIAGNOSIS OF CARCINOMA OF THE OESOPHAGUS

BY EDWARD S. EMERY, JR., M.D.†

LESS than a year ago* Gaetan and I published in this *Journal* an article on carcinoma of the oesophagus. We emphasized at that time that symptoms are frequently atypical in the early stages so that patients who complain of indefinite oesophageal symptoms should be studied by the x-rays and the oesophagoscope¹. We also pointed out that symptoms typical for carcinoma are more dependable than a negative roentgenologic and oesophagoscopic report. Early diagnosis of oesophageal cancer depends upon a recognition of these principles. Hence, I am reporting another case to illustrate their value and to emphasize their importance.

J. T., Medical number 30386, is a Jewish tailor who entered the Medical Service of the Peter Bent Brigham Hospital in June 1927, at the age of 62. The family and past histories were unimportant. He had a duodenal ulcer which had been giving symptoms for nine years. The physical examination was essentially negative except for moderate arteriosclerosis and an enlarged heart with auricular fibrillation. The symptoms of ulcer recurred three months after discharge from the wards and he has been followed intermittently in the Out Door Department up to the present.

On December 30, 1932, he came to the Out Door Department complaining of a new distress. He described this as a "pain beneath the upper sternum after one swallow of solid food. This takes some time to descend. Solid food has invariably repeated this distress but liquid food and the large stomach tube do not cause trouble." An x-ray taken a few days later did not reveal any pathology in the oesophagus. Because of the persistence of dysphagia I referred him to the medical wards again on April 1, 1933, for a thorough study. The history taken by the House Officer at this time is reported fully, much of it verbatim, as it is characteristic for carcinoma. It is as follows:

On December 30, 1932, the patient was seen with a new complaint of pain beneath the upper sternum

after swallowing solid food and it seemed to take the food some time to reach the stomach. Liquid food and a large stomach tube gave no trouble. X-rays showed only the duodenal ulcer. "The symptoms persisted and have grown worse, and now the delay in swallowing solid food, and occasionally liquid, seems to be just below the xiphoid process. Food seems to delay at this point for about one-half second and there is, occasionally, a twinge of pain. Deep inspiration aids the food in passing into the stomach. After swallowing there is a short wave of regurgitation or hiccup with which he seems to raise some gas but no water brash. Because of this distress there has been a great deal of annoyance in eating and it requires a much longer time to eat a meal. It is necessary for him to take a swallow of liquid after practically every bite of solid food. In the past few weeks he has been on a Sippy diet which included semi solids but this food also and occasional liquids, cause the same symptoms."

An x-ray report on April 3, 1933, was as follows:

Eighth examination showed slight dilatation of the oesophagus with delay at the cardia but no irregularity or obstruction. Stomach was normal except for large gastric rugae. Duodenal cap was again deformed apparently the same as before. No crater was demonstrable. Ileum and cecum normal. Impression: Duodenal ulcer, inactive. "A few weeks later another roentgenological examination "again showed slight dilatation of the oesophagus with delay at the cardia but no definite irregularity or filling defect. Appearance suggests spasm." A gastric analysis showed a normal acidity and he was discharged with a diagnosis of "spasm of oesophagus, lower end."

He returned to the Out-Door Department, April 21, because of "a steady increase in the distress" and I, therefore, referred him to the Surgical Service for an oesophagoscopic examination which was reported as entirely normal, and he was discharged with a diagnosis of cardiospasm. Swallowing improved slightly after the oesophagoscopy.

Another roentgenological examination on June 23 was reported as follows: "Fluoroscopy and films of the oesophagus showed it to be definitely dilated in its lower half. There was a smoothly pointed area of constriction just above the diaphragm and the lower end of the oesophagus was somewhat tortuous. It was directed to the left just before entering the hiatus. In the supine position the cardiac end of the stomach was well filled and smooth in outline with

*This paper was submitted for publication in October 1933.

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plus (red area from 12 to 20 mm in diameter), and three plus (a red area more than 20 mm. in diameter) The readings were made in from four to ten minutes after injection, and the reactions disappeared, as a rule, within a few hours The injections were slightly painful from the stretching of the skin, but the patients did not usually object to them Practically no one of the patients reported any residual soreness A negative reaction indicated a female fetus, the two and three plus reactions showed male children The records of the one plus reactions, as is shown in table 1, were almost equally divided between the males and the females

The findings of the 136 cases tested with the stock testicular extract gave poor results, and we asked that a change be made in the solution by removing more of the extraneous protein material* With the new ampoules furnished us, we tested 534 more cases with mod-

*We wish to thank the Abbott Laboratories for their cooperation in furnishing us with the necessary material for this work.

erately good results The exact distribution of the cases tested is indicated in the tables

The exact mechanism of the test is not understood, except perhaps upon the basis of allergic reaction This explanation is entirely hypothetical, and is subject to correction

Table 2 is self-explanatory and needs no further elaboration.

The technique of this test is very simple and readily executed by anyone Its accuracy needs to be improved, and it is hoped that this can be done by further experimentation by us and by other workers

We wish to thank the several interns who assisted in this work at the Out Patient Department, and also the Chiefs of the various Obstetrical Services for permission to carry on this work.

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DEVICE FOR FIXATION OF HANDS AND ARMS FOR CERTAIN OPERATIVE CASES

BY BENJAMIN D ADAMS, M.D.*

I The Device

- 1 A piece of toweling 8 feet long, 16 or 18 inches wide would do very well
- 2 At one end, a piece 10 inches long is folded upon itself and fixed by sewing, making a loop as shown in the figure (A) (This now makes the length of the device 7 feet 2 inches)

II Its Position on Operating Table

- 1 It is placed doubled on table with the sewed loop on the uppermost division (See figure Toweling is shown elevated



from table to demonstrate its position, the sewed loop (A) and the loop (B) made by doubling the toweling on itself)

III Fixation of Patient

- 1 Patient placed on table with the toweling directly underneath him One arm is placed in sewed loop (A) and the other in loop (B) and the toweling adjusted to include forearm, greater part of hand, and elbow
- 2 Grasp toweling at point (C), drawing the upper division taut, thus fixing extremity in loop (A), taking care that hand and arm are in the proper position
- 3 Grasp toweling at point (D), drawing the lower division taut, thus fixing extremity in loop (B), taking care that hand and arm on that side are in proper position.
- 4 The free end of toweling is then tucked out of the way

IV Results with Advantages

- 1 Good fixation—with patient's weight over the double division of toweling, the extremities are securely fixed in loops to prevent further annoyance to operator, and to prevent malposition of patient's extremities during operation
- 2 No points of constriction to extremities or to respiration
- 3 No pins or tricky adjustments
- 4 Simplicity of procedure—makes its use always satisfactory in the hands of the various and continually changing personnel which has to be contended with in most operating rooms

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canal, with urine from women between five and ten months pregnant. The rabbits were killed forty-eight hours after the injection, and the testicles removed. Female children are predicted when the testicles of the rabbits become enlarged and congested, and the vessels on the surface are engorged and dilated. When studied microscop-

no direct relationship between the reactions of the rabbits' testicles and the sex of the child. In their experiments, they found this test to be accurate in from only 35.3% to 52.9% of the cases. Furthermore, as described, the method is somewhat complicated and requires trained technical workers. This difficulty would render

TABLE 1

SHOWING THE ACCURACY OF CASES TESTED BY BOTH THE STOCK TESTICULAR EXTRACT AND THE IMPROVED EXTRACT

	Stock extract	New extract
Total number tested, except for one plus reactions	136	468
Number correct	90 (66.2%)	398 (85.1%)
Number wrong	46 (33.8%)	70 (14.9%)
Number diagnosed males	100	294
" " " correctly	61 (61%)	242 (82.3%)
Number diagnosed females	36	174
" " " correctly	29 (80.6%)	156 (89.6%)
Number of one plus reactions, found to be males	19	29
Number of one plus reactions, found to be females	26	37

TABLE 2

SHOWING THE PARITY, THE MONTHS OF PREGNANCY DURING WHICH THE TESTS WERE MADE, AND THE DISTRIBUTION OF THE SEX OF THE CHILDREN AS DIAGNOSED BY THE NEW EXTRACT*

Parity	Months of Pregnancy										Totals
	3	4	5	6	7	8	9				
1	3 2	2 2	5	12 7	14 7	27 18	36 18				99 54
2	1 1	1 2	2	7 8	12 18	17 10	21 13				59 54
3			1 1	5 3	8 4	14 7	8 5				36 20
4		1	2 1	2 3	10 5	3 2	6 2				24 13
5				1 1		4 3	8 3				13 7
6					1	2 1	4 2				7 3
7						1 2	1 1				2 4
9						1	1 1				2 1
Totals	4 3	4 4	8 4	27 22	45 35	69 43	85 45				242 156

*The figures in the upper left hand corner of each item indicate males; those in the lower right hand corner indicate females. Only the cases diagnosed correctly are shown.

ically, they show increased cellularity and vascularity and beginning spermatogenesis, as evidenced by the formation of spermatogonia and spermatocytes, but no spermatids or sperm cells are present in any case. Those testicles which show no reaction predict males.

Recent study by Curphey and Romer² in an attempt to confirm the above-mentioned findings, led the authors to conclude that there was

the test inapplicable in regions where such facilities were not readily available.

About two years ago we attempted to discover a simple test to foretell the sex of the fetus. The first product to be used was a stock testicular extract of which 0.2 to 0.3 cc were injected intradermally. The reactions were arbitrarily labeled as negative (no reaction), one plus (a red area 12 mm in diameter), two

ty years in a single parish felt conscious of his limitations and decided to go into the cellar and select several of his sermons given during the first years of his professional career. As he journeyed to the cellar to the barrels which contained his manuscripts, he thought with what pride he would again present to a congregation these earlier masterpieces. As he reviewed a number of them in the presence of his devoted wife he finally commented as follows: "Is it possible that I ever had the audacity to present such material to any congregation?" They had both felt that those earlier sermons were masterpieces of literature and philosophy.

You are amply qualified to undertake the practice of medicine. However, those of you who still realize that your education is really never completed can appreciate this signal of warning and accept these expositions as constructive advice intended to give you greater power in your growth in medical service.

You may have all of the qualifications as to training for the race, you may have received completed technical training, you may have a just pride in your present equipment as physicians, yet it remains for a wise and skilful application of your training to determine your place in the sun.

As illustrative of commendable zeal and earnestness of purpose I recall two outstanding instances where patients were being interrogated by internes of this institution. One was an elderly lady who was not altogether clear in her mental reactions and who was a private case and was in our hospital for observation only. By some, shall I say obscure misfortune, a young lady interne was assigned to the case. I happened to arrive just as she was departing from her conference with the patient. Her face was all aglow with satisfaction as she said to me, "I have just taken the finest history in my life and it took me over an hour." I expressed some surprise at this statement. On arriving at the patient's bedside I found her annoyed, confused, exhausted. Upon her convalescence, some days later, I was able to start my studies of her case.

The second was in our Evans Memorial where a "long form" was being carried out. In this case the patient was unusually keen and responded to the first installments of the questionnaire as reliably as possible, but she suddenly perceived the humorous side of this all-inclusive and searching cross-examination, and decided thereafter to give alternate answers of yes and no. She was so amused with the entire proceeding that she could scarcely refrain from betraying her feelings. This history went through on schedule and received an analysis by our worthy Dr. Rowe.

I refer to these specific instances as indicative of the effort and thoroughness of our interne's application of the importance of the personal history, which is quite commendable. On the

other hand, had they passed through the mill of experience, they would have observed that in the first instance the patient was in no condition to give a faithful account of her life's story and in the second instance, they would have reacted quickly to the inconsistencies of the answers made.

2 With all this splendid training, although not sufficient to qualify in the same class with our Dr. John Greene will it not be wise to consider the advisability of being the large toad in the small puddle, the useful general practitioner in the smaller communities, rather than the small toad in the big puddle, or just another specialist in the great centers? Both paths are open for your journey. Which direction you take rests with you.

So much has been said in recent years in defense of the family physician by college presidents and distinguished citizens in other lines of welfare philosophy, to say nothing of the numerous medical and surgical grants who have in no uncertain terms forecast the future of medicine, that it may seem idle for me to offer any thoughts that might add to the present understanding of the public toward the physician and the specialist. It has taken years of turning the wheel to arrive at a point where experience as a family physician with constant contacts with specialists permits me to qualify as one who can possibly help you in your plans for the future.

Some years ago in Detroit at the annual convention of the A. M. A., the then President of the University of Michigan, Dr. Clarence I. Little, as orator of the occasion expressed his views on this vital question in such convincing words that I beg your indulgence while I review some of the salient features of his address before this distinguished body of physicians.

His defense was for the return to the masses of the family physician of bygone days. Not that he deprecated the great advances which science had brought to the preparation of the medical student of this day, nor the necessity for the highly-trained individual along special fields. All this is a part of our present civilization. Notwithstanding the advantages of the required years of preparation for the highly trained and splendidly equipped physician whose services when needed, are without question of the greatest importance to humanity, only ten to fifteen per cent of all illness call for this superman, the specialist of today. But what of the eighty-five to ninety per cent who either cannot afford such medical skill, or who are far removed from centers where such service is available? They are those whose conditions are in no way alarming, to whom a protective service, a preventive medicine, a friendly adviser, a power for good, in a small community, in other words, a family doctor, can best administer. Continuing, he remarked that hundreds of towns and scores of cities in this coun-

LEST WE FORGET*

BY JOHN A. ROCKWELL, M D †

Members of the Staff of the Massachusetts Memorial Hospitals, Internes, Ladies and Gentlemen

I CONGRATULATE the Massachusetts Memorial Hospitals in offering the opportunities and facilities which have developed you

I congratulate the young men and women who have successfully scaled these hurdles and now augment our honor roll

I congratulate the public, which will be served by this group of trained minds and sympathetic natures in its hours of need and stress

We welcome you and add your names to our long list of well-schooled, conscientious and worthy physicians

True it is that the preparation of today for the practice of medicine carries many years of self-sacrifice and devotion in perfecting this art. We live in an age of applied science, and medical culture has progressed with the advanced thought and practice of this day. But if you have no misgivings as to the degree of perfection and ability with which you may sway your intellectual attainments, beware of your laurels, for in earlier days one Dr. John Greene, Jr. (1790-1867) of Worcester, possibly the great great-grandfather of our Milo Green, describes himself on his bookplate, among other data, as "Physician, Dentist, Surgeon, Apothecary and Man Midwife." And not satisfied with this announcement he adds,

Physicians are as facts can tell
The allied friends of death and hell"

I call to mind that in my own family annals it is recorded that when my grandmother, at boarding school in New York, was told by an admiring relative that she was "bright as a button" my great-grandmother thought it necessary to counteract the flattery by the stern admonition "Remember, Mary Watkinson, *there are pewter buttons!*" Even in our day and generation corresponding types of this character—simplicity and humility—still have their value as controlling qualities

But quite seriously and with due respect for your attainments, I feel that the current hospital-interne graduate possesses a degree of medical and surgical training which transcends anything that was expected or even hoped for of our graduates of fifteen or twenty years ago. A community may truly count itself fortunate that finds in its midst men and women who

have completed this comprehensive preparatory training fitting them for their active demonstration of this accumulated professional knowledge.

Some of you, no doubt, will direct your abilities to special work and add your names to the ranks of specialists. Others of you will take the wiser course and add experience, born of contacts in actual general practice, before determining your definite future course. All of you are merely on the threshold of your life's work. It is the successful *application* of your training more than the book or technical knowledge that will win conclusive victory.

In this informal presentation of suggestions which might be of benefit to you young physicians, time will permit a skeleton only of what might very properly be moulded into a full and complete essay. I have, therefore, selected but three phases out of a score of possible topics which I feel will be of benefit to you at this time

- 1 The necessity of experience added to your present technical knowledge
- 2 The need of more "family doctor" practitioners
- 3 The spirit of service

1 In granting college letters—the highest award in athletic sports—the *effort* made by the individual does not necessarily qualify him for this signal evidence of superiority. It's the winning by virtue of high development of the application in his specialty. Many individuals are members of the squad, but few are champions

The gentleman fisherman may have all the equipment and enduring patience when angling for his trophies, but many times the fish are taken by a "pin for a hook" fisherman, because of the applied knowledge through homely experience, or even by virtue of a native ability which he possesses

A classmate of mine at Technology obtained a minor engineering position when the Boston subway was being constructed. In his innocence he felt that he had received instruction which would eminently fit him for his job. One day while he was struggling with mathematical formulae for determining certain measurements the boss foreman of the gang approached him and asked of him "What's the trouble?" While my friend was explaining what he was endeavoring to determine, the foreman made two or three finger computations and gave him the answer almost instantaneously. My friend has told this story a number of times at various class reunions, illustrating the very point which I am endeavoring to impress upon you

A distinguished preacher having served thir-

*Address before the Hospital Staff and Graduating Exercises of the Internes of the Massachusetts Memorial Hospitals June 20 1933

†Rockwell John A.—For record and address of author see
"This Week's Issue" page 437

to meet this super-service. As time went on, this young man was appointed general manager of one of the company's factories some forty miles from Boston. The great problem confronting them was "what shall we do for medical service when we move to the country?" At the end of ten years, the young man was brought back to Boston as president of this textile organization and the great problem which confronted his family on the eve of their moving back to the city was, "How in the world are we going to get along without the services of our good reliable family physician, Dr. Blank?"

With the passing of the years of our day we have noted a change of attitude by the public toward things medical. There is almost a disrespect for physicians by a certain group, there is a shopping around tendency by another, the once termed "faithful patient" is about as obsolete as the old-time "family doctor." It is apparent that the men and women of your generation should forecast the future with greater concern for your personal interests, if for no other reason, and that in your professional activities you should manifest a greater regard for the personal equation and a sympathetic inter-

est in the family's needs, in the broadest sense, so that you can truly practice the art as well as the science of medicine, with equal facility. Unless these standards are maintained, and unless some concerted movement is made to reestablish confidence in the type of service which you are prepared to give, there is danger that such service will be largely superseded by the various types of pseudo-arts of healing, some of which are offering exactly what we have grown away from. The field of your service will not only be a disappointment to you in point of success, but the public will have gone out with the tide of present day valuation, and you will be left behind stranded. On the other hand, if you add to your present equipment the spirit of service, the simplicity, although often the sternness of the family physician, and are prepared to harvest the accumulated stacks of experience from the field of professional activities, you will reblaze the trail so faithfully engineered and traveled by our forebears in medicine—a path illuminated with the high-lights of modern medical training.

I wish you all the success and happiness which you deserve.

TO BE SUCCESSFUL

FAMILY PHYSICIAN

- Don't treat something you do not understand with out expert advice
- Don't fail to be frank with your patients
- Don't fail to talk their language
- Don't fail to write out instructions
- Don't fail to consult the nurse on the case.
- Don't talk shop to patients
- Don't tell patients how good you are
- Don't fail to have outside interests
- Don't have financial dealings with patients
- Don't keep moving from town to town. Select your location carefully and then stick
- Don't fail to show the spirit of service

Practice

- Firmness, fairness and frankness with the patient, but do not show temper
- Accompany the patient to the specialists when possible. A personal introduction goes a long way and the specialist would benefit greatly by the added conference with you while on the case
- Be neat and clean in your personal appearance
- Give more time to the *convalescent* stage of the disease
- Show cheerfulness and encouragement in your work
- Be fair to your professional rivals

SPECIALIST

- Don't work alone. Find out who the family physician is when possible
- Don't fail to have close contact with the family physician
- Don't omit the written reports to the physician.
- Don't disregard the patient's story
- Don't protect the family physician when gross negligence is evident.
- Don't necessarily form conclusive opinion on single visit evidence
- Don't object to a second opinion in obscure cases
- Don't overcharge
- Don't fail to show the spirit of service
- Be considerate of patients and family's reactions to your opinions. Select your words with care
- During an extended examination observe carefully the patient's condition lest a too fatiguing conference be held
- Don't send patients home from office operation on the elevated when they request a taxi

try either lack medical service entirely, or are frankly undermanned so far as the cities are concerned. Can we expect that young couples will venture into the wide open spaces and start homes and families when it is known that no medical practitioners are within miles and miles of their immediate environment? This, he said, was one of the great problems in the Government's effort to encourage the city dweller to make his home in the great fertile sections of this country.

As a possible remedy for this lack of medical service, he suggested that medical schools require some pledge by the matriculant, obliging him to serve for a specific number of years as a general practitioner in small communities before he burst into full flower as an internist or specialist. I will not burden you with further comments on Dr. Little's most remarkable presentation of this serious problem. He certainly stimulated a slumbering consciousness of the fact into a wide awake realization of impending dangers.

3 Vital statistics reflect a very different picture today as compared with similar figures of a generation ago. Many of us recall full well typhoid fever, scarlet fever, diphtheria and tuberculosis, to say nothing of less punishing diseases, which are now so rare that one can visualize a time in the not far distant future when they will be practically stamped out. Medical topics are discussed in our magazines, medical talks for the public are given in our medical schools. Universities have their courses in Public Health and have physicians who meet the emergencies of all students, to say nothing of keeping exact records of their physical status upon entering and leaving college. The radio pesters us with advice on numerous medical issues and has remedies for practically all the ills that flesh is heir to. In fact, as someone has recently stated, with the exception of emergencies and heart disease, birth and old age will constitute the chief sources of medical requirements in the near future. With a public thus medically conscious and progressively averse to the practices of group medicine and specialists' fees, unjust as many of its comments are, it behooves those of us who have been in harness for many years to offer advice to those of you who are taking your first steps.

A few years ago at a meeting of the New England College Conference on Athletics the discussion arose as to schedules of athletic sports and the number of cuts and the number of hours which should be allotted to this side of college education. A faculty member from one of the smaller colleges commented on this subject as follows. I met with our athletic association and the managers of the various athletic teams. We had spent an entire evening in going over the program for the year. I soon found that a great deal of time was being allocated to

these sports and I suddenly began to realize that unless some opposition was made to their modernistic understanding of a college education, the primary object of their coming to school was rapidly being relegated to a very small proportion of their college year, and with some hesitancy I suggested "would it not be in keeping with the spirit of the day to allow at least one hour a day for classroom work?"

In this modern training for the special student and with our present twentieth century philosophy (our scientific perfection), have we not failed to consider the prime objective in medicine, at least to some extent? Physicians in earlier days (and some few today) practiced their art by giving a sympathetic survey, as well as a scientific analysis of their patients. The spirit of service, to heal the sick, to relieve suffering, to be a friend as well as physician, to be understanding, to be even the Good Samaritan, are practices in his daily rounds. In the rush and hurry and enthusiasm of scientific medicine have we not placed ourselves in the same category with the experience of the college professor above referred to? Have we forgotten the qualities which made the old family doctor beloved, revered, honored and useful, even though his medical equipment was miles behind the present standards?

I wish to cite two cases exemplifying this spirit of service which was given to a suffering humanity, a public which feels all too keenly the lack of personal interest shown by many physicians of this day and generation.

In my class at the Medical School there was one candidate whose marks were so close to the line that, as I recall it, several faculty conferences were held before making their final decision in his case. He was poor, he had had no collegiate or pre-medical training, he had borrowed more money to become married in his senior year, he had few qualifications save the spirit of service, and this alone influenced the faculty to grant him his degree. He was always the last student to leave the dispensary clinics and would attend any call in the district, no matter how tired or how late the hour. This classmate settled in a small town in Maine without even having had a hospital internship. When he arrived on a bicycle, ready for service, there were four other physicians in this community to whom he was a laughing stock and a joke. At the end of ten years he had superseded them all and was a highly successful and useful physician, having won the trust and confidence of the people to an unusual degree.

Another example. A young family was brought up in Boston. The father was a member of a textile manufacturing company. The children's health had been engineered by a group of Boston specialists and they were a healthy, happy family. Fortunately, there were means

CASE RECORDS
of the
MASSACHUSETTS GENERAL
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F M PALMER, A.B., ASSISTANT EDITOR

CASE 20081

PRESENTATION OF CASE

First admission A sixty-two year old German brewer entered for the first time complaining of hematuria

Thirty-three years before admission he noticed that his urine was bloody one morning before going to work. He worked for two hours and then was forced to go to bed because of weakness. The hematuria continued for five days, during which time he passed many large clots. He remembered no other details and was perfectly well until eight months before admission. At this time he noticed that when he worked hard he had to pass more urine than normally. This frequency was ten or twelve times during the day and four to six times at night, and was associated with a moderate amount of burning but no hematuria. These attacks persisted for about twenty-four hours after heavy manual labor. Four months before admission he had bilateral hernia repair at another hospital. On the tenth postoperative day he developed pain in the chest without cough or hemoptysis. Associated with this were pain and swelling in the left leg which persisted for three weeks. At that time the frequency and slight burning were constant. Six weeks before admission he noticed for the first time small black clots in the first portion of his urine. Occasionally the blood would be terminal and almost always black. Four weeks before admission he passed bright red fresh clots. The burning became more marked and the stream much weaker. For the past six weeks he had had occasional difficulty in starting the stream. The hematuria increased until four weeks before admission, when it improved somewhat after taking pills prescribed by a physician. He believed he had lost considerable weight.

Family history His father died of shock at sixty-nine. His mother died at seventy-nine.

Marital history His first wife died of tuberculosis at the age of thirty-one. He had lived with her for seven years and had had one child who died of tuberculosis at the age of twenty-four. His second wife was living and well.

Physical examination showed a fairly well developed and nourished man with evidence of moderate loss of weight. The mucous membranes were slightly cyanotic. The sclerae were

injected and had a slight icteric tint. The cervical, axillary and inguinal lymph glands were slightly enlarged but not tender. There was slight tenderness in the suprapubic region and also in the left flank posteriorly. There were bilateral scars of the repaired herniae. A drop of bloody urine was found on the end of the penis.

Examination of the urine showed a slight trace of albumin, a specific gravity of 1.004, 25 white blood cells per high power field and large numbers of red blood cells. Examination of the blood showed a red cell count of 5,400,000 with a hemoglobin of 90 per cent. A phenolsulphonephthalein test showed 40 per cent excretion, 25 per cent of which was in the first half hour. The icteric index was 3, the non-protein nitrogen 27 milligrams. A Hinton test was negative.

X-ray examination of the chest showed clear lung fields. The outline of the right kidney was distinctly shown, being rather large but normal in shape. The pelves and calices were well filled and appeared normal. There was a rather sharp kink in the ureter as it left the pelvis. On the left side the kidney was not well shown in any of the films. In the region of its pelvis there was a large irregular mass. There was also a small shadow in the region of the upper pole of this kidney. The pelvis was not well shown. In the course of the ureter overlying the sacrum there was a small dense shadow, irregular in shape, and just below the sacro-iliac articulation there was a large irregular dense mass. Similar smaller shadows were present on the right. There were several small shadows in the region of the bladder. The bladder itself was well filled with the dye and normal in shape. The lower end of the right ureter was visible but that of the left was not.

Cystoscopy was done. In view of the extensive genito-urinary pathology it was decided not to operate at the present time. He was discharged at the end of a week, to be followed in the Outpatient Department.

CLINICAL DISCUSSION

DR. GEORGE W HOLMES We have a film of the chest which shows normal lung fields, prominence of the heart shadow to the left and some tortuosity of the aorta. There is no evidence of the pulmonary upset that he had before coming in, but of course the film was taken some time after that occurred.

We have a series of films of his urinary tract. This film shows a shadow which could be a stone in the region of the kidney or calcification in the region of the suprarenals.

DR. G GILBERT SMITH Did the plain film show anything?

DR. HOLMES The shadow was there before the injection. I should like to know if when you injected the fluid it extended up into this

NEW HAMPSHIRE MEDICAL SOCIETY

DOCTOR DENNIS EDWARD SULLIVAN

DR DENNIS EDWARD SULLIVAN was born August 23, 1863, at Augusta, Maine, son of Daniel W and Catherine (Mann) Sullivan. He was educated in the schools of Augusta, at Bowdoin Medical College and Bellevue Hospital, New York and received his degree of M D in 1885. He practiced medicine in Concord, N H for many years and was known as a physician of much skill, carrying on an extensive practice up to the moment when he was seized with his final illness.

Dr Sullivan's interests were not confined to his own practice, nor even to his own profession. He served several terms as a member of the Board of Education of Concord Union School district and throughout his life was interested in educational matters. He was a member of the Wonalancet Club, the Knights of Columbus and the Ancient Order of Hibernians and was active in St John's Catholic Association and St John's Catholic Men's Club.

For several years he was a member of the United States Board of Pension Examiners. He had served the New Hampshire State Medical Society as secretary since 1908 and since 1913 had been a member of the State Board of Health and was on the staff of the Margaret Pillsbury Hospital. During the World War, he was on duty at the base hospital, Camp Upton, Long Island.

He represented the New Hampshire Medical Society in the House of Delegates of the American Medical Association.

Dr Sullivan married on July 9, 1889, Mary E Scanlon, who survives him. A son, Paul Mann Sullivan, a brother, Eugene Sullivan and sister, Miss Elizabeth Sullivan, all of Concord, also survive him. An older son, Dr Edward Sullivan, died in 1927.

After a sudden illness, Dr Sullivan passed away on January 19, 1934.

THE SUCCESSOR TO DOCTOR DENNIS EDWARD SULLIVAN

THE last paragraph of Chapter 6, Section 4 of the by-laws of this Society reads as follows:

"In case of a vacancy existing in the position of Secretary-Treasurer, the President of the Society is empowered to appoint a Secretary-Treasurer *pro tem* to act until the next regular meeting."

In accordance with this authorization, I have appointed temporarily as Secretary-Treasurer,

Dr Carleton R Metcalf,
5 South State Street,
Concord, N H

Until a Secretary-Treasurer is duly elected at the next regular meeting in May, Dr Metcalf will carry on all of the duties which formerly devolved upon the late Dr D E Sullivan.

Very truly yours,

ROBERT J GRAVES, *President*,
New Hampshire Medical Society

The urine was grossly bloody and showed a trace of albumin. Examination of the blood showed a red cell count of 4,700,000, a hemoglobin of 75 per cent. The white cell count was 8,900, the non-protein nitrogen 26 milligrams.

X-ray examination of the genito-urinary tract was the same as on the previous examination.

On the tenth day a left nephrectomy was performed. He was put on constant drainage a few days following operation and remained in fairly good condition. Three weeks following the nephrectomy a right ureteral anastomosis to the sigmoid was performed. A few days following this operation he developed rales in both bases with slight dullness. His temperature rose to 103°. He had occasional chills. One stool was grossly bloody. He was given intravenous glucose, but continued to go downhill and died six days after the last operation.

FURTHER CLINICAL DISCUSSION

DR. HOLMES: There are two points in connection with this case that I should like to emphasize. First, the calcification seen in the ureter and in the kidney can occur in carcinoma of the pelvis, but it would have to protrude into the pelvis. Tumors within the kidney itself where the urine does not come in contact with them do not in my experience show calcification. In this case the shadow seems to be in the cortex, and I think that is evidence in favor of tuberculosis. The same thing happens in the bladder, when a tumor protrudes into the bladder itself, so that it is washed by the urine, it may have calcification over the surface, but this mass seems to be outside the bladder. It seems very unlikely that that mass below the sacro iliac articulation could be carcinoma. Perhaps Dr. Mallory will comment on the possibilities of calcification in these tumors outside the urinary tract.

The other question was whether radiation of the bladder was considered. I think in tumors of the bladder particularly the bleeding ones do very well under radiation. A good deal of irritation disappears and the bleeding stops almost invariably. There may have been some very good reason why it was not done.

DR. J. DELLINGER BARNEY: There is an intervening step I did not hear about or have forgotten. What did we do to the tumor of the bladder?

DR. SPENCE: We let it alone. Transplanting the ureter into the colon was just a palliative measure.

DR. BARNEY: As has been said, I transplanted the ureter into the sigmoid. There were no particular difficulties about it, but perhaps unusual care was taken to make anastomosis as perfect as possible because it was his only kidney. For some reason it did not work, but hindsight being better than foresight I think it would have been better to wait longer

than three weeks to do this. He was not in good shape, with tuberculosis perhaps the main thing. In other words he was devitalized. That may be the reason why his anastomosis did not work. It is also quite possible that the remaining kidney was also tuberculous, because we know, granting that the first one was tuberculous, that it is quite possible that the right one was, but we could not find the usual evidences of it. It is not uncommon to find the second kidney tuberculous when the clinical evidences are against it. In fact even the histologic evidence did not show that it was tuberculous. It is hard to explain why the anastomosis did not work.

DR. MALLORY: Have you anything to add, Dr. Smith?

DR. SMITH: Only to say that my experience in transplanting ureters in these cases of advanced carcinoma of the bladder has been very discouraging. The patients have no resistance at all. The slightest bit of sepsis will kill them. I think in that advanced type of case it is just luck if you get by, no matter how well you do the operation. Usually the kidneys are both infected and you have that handicap already to start with.

DR. BARNEY: I think it has been mentioned that at the time of this operation, at which I did the anastomosis, evidences of much more extensive neoplasm in the bladder were found than we had suspected by cystoscopy and other methods of examination. It was very extensive and apparently extended outside the bladder.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Renal tuberculosis
Carcinoma of the bladder

ANATOMIC DIAGNOSES

(Probable tuberculosis of the left kidney)
Operative wound left nephrectomy
Epidermoid carcinoma of the bladder
Operative wound anastomosis of right ureter with sigmoid
Separation of anastomosis
Pyonephrosis, right.
Pelvic peritonitis
Chronic fibrous pleuritis, marked.
Healed pulmonary tuberculosis
Arteriosclerosis, marked coronary, slight aortic
Aortic stenosis, calcareous

PATHOLOGIC DISCUSSION

DR. MALLORY: The kidney which was removed at the nephrectomy was a completely destroyed one. There was simply a shell of connective tissue around a huge caseous semi-calcified mass. At no point could we find anything that suggested an active tuberculous process. I think on the doctrine of chances that it probably was a burned out tuberculosis, although I do not see how anyone can be perfectly sure in a case like this without actually

area If so it might be an abscess in the upper pole of the kidney

DR RICHARD CHUTE How about the shadows in the lower part on the left side?

DR HOLMES Could you get a catheter up there?

DR HARRY M SPENCE No, we were unable to

DR HOLMES I do not believe it is a stone There may be a stone among the shadows, but certainly not all of it is stone Tuberculosis might give such a picture In the lower end of the ureter there is also a shadow here which might be a calcified gland

Was any attempt made to give him intravenous dye?

DR SPENCE That film shows it

DR HOLMES It is a non-functioning kidney This looks still more like tuberculosis If he had a stone and a fragment had broken off and had gone into the ureter, blocking it, causing hydronephrosis with calcification, the picture would be the same

DIFFERENTIAL DIAGNOSIS

DR TRACY B MALLORY I have asked Dr Smith to attempt to give us a differential diagnosis in this case

Dr Spence, you might give us the cystoscopic findings

DR SPENCE The bladder was uniformly injected, the prostate atrophic On the left lateral wall there was a flattened, elevated, ulcerated mass the size of a twenty-five cent piece with a necrotic surface which was biopsied

DR SMITH Thank you That is what I wanted to know

I never saw this case, and I admit that reading the history gave very little information as to the exact diagnosis The two possibilities that were in my mind up to the point where Dr Spence gave us this information were tuberculosis of the left kidney and a bladder which was bleeding from tuberculous ulceration, or new growth

I think the interesting points in connection with that diagnosis are first that episode twenty or thirty years ago when he had an attack of marked hematuria with the passage of clots that cleared up and left him entirely well I should feel now that he probably had a papilloma of the bladder which had stopped bleeding and had gradually undergone malignant change In a series of cases of carcinoma of the bladder which we looked up we found two or three that had long intervals—one of them I think had twenty-five years—between the first attack of hematuria and the later development of carcinoma of the bladder

In tuberculosis of course one of the first symptoms may be hematuria That sometimes happens when the ulceration in the kidney pelvis involves a small vessel, the patient may bleed quite profusely, but I have never seen one bleed

so freely as this man evidently did So I should think on the basis of that fact alone that the diagnosis of carcinoma was more probable

Also, in regard to the character of the hematuria which the patient had been having since he came into the hospital this last time, the record states that he passed small black particles of blood which I should interpret as being little clots that had formed at the bleeding points of the tumor At times he had terminal hematuria, most marked at the end of urination, which is also a frequent finding of tumor of the bladder, because as the bladder closes down it apparently squeezes the tumor and the tumor bleeds more freely His urine was said to be pink all the time, which indicates a constant seepage of blood from some point in the bladder That seems as if the hematuria was distinctly more pronounced than one would expect it to be from a tuberculous bladder alone

Of course we can get marked bleeding from an enlarged prostate, but from what Dr Spence tells us we know he had no retention Carcinoma of the prostate is not likely to cause bleeding until late in the course of the disease when the nodules of carcinoma have grown up on the trigone and around the bladder neck and are ulcerated into the bladder Hypertrophy of the prostate is much more likely than carcinoma

It seems to me that if you look at this film closely you can see the indentation on the left lateral wall which probably was a filling defect due to the growth.

The reason for destruction of the left kidney is not perfectly clear These look to me like tuberculous glands I should think he might possibly have tuberculosis of the kidney in addition to carcinoma of the bladder I should say that the destruction to the kidney from back pressure made by the tumor around the ureteral orifice, although that is the most common cause of death in carcinoma of the bladder, had hardly been pronounced enough in this case to cause a long-standing pyonephrosis such as this appears to be I would hazard a rather wild guess that he has tuberculosis of the kidney, and we know from what Dr Spence said that he has carcinoma of the bladder

FURTHER HISTORY

History of interval After his discharge he was under the care of his own physician All his urinary symptoms persisted practically unchanged His frequency was now about every half hour during the day and ten to fifteen times each night Gross hematuria was intermittent, but the urine always had a pinkish tint He had suprapubic pain and also pain in the bladder that radiated down the posterior aspect of the right leg

Second admission, six months after his previous discharge

The physical examination was the same as on the previous admission

There was moderate sclerosis of the retinal arteries without hemorrhage or exudates. The heart was slightly enlarged, the percussion borders being 9.5 centimeters to the left of the midsternal line and 3 centimeters to the right. The sounds were of fairly good quality, without definite organic murmurs or gallop. There was a loud high-pitched to-and-fro sound all over the precordium, loudest at the base. This was taken to be a friction rub, although it was less rough than one would expect. The blood pressure was 170/80. There was very slight non-pitting edema of the feet. The bladder dullness extended two thirds of the way to the umbilicus. The chest was clear except for a few moist râles at the bases.

The temperature was 101°, the pulse 102. The respirations were 30.

Examination of the urine showed a specific gravity of 1.012, a trace of albumin and occasional red blood cells, epithelial cells and bacteria. A catheter specimen showed colon bacillus. Examination of the blood showed a red cell count of 2,400,000, with a hemoglobin of 45 per cent. The white cell count was 17,700, with 95 per cent polymorphonuclears. Examination of the stools showed them to be of liquid consistency and alkaline reaction, with a two plus guaiac. The non-protein nitrogen was 190 milligrams, the carbon dioxide combining power 24 per cent.

The patient was given 1500 cubic centimeters of normal saline subcutaneously and morphia p.r.n. His course was progressively downhill. In spite of intravenous glucose and daily claysis of normal saline he put out very little urine. He was seen by a urological consultant, who found no obstruction to account for the retention and apparent uremia. The patient failed rapidly and died five days after admission to the Emergency Ward.

DIFFERENTIAL DIAGNOSIS

DR WALTER BAUER. There is obviously not much doubt that we were dealing with a patient who had uremia, and in reconstructing the story I think we can say that he showed evidence of impaired kidney function going back over a period of at least several years.

He had a history of nocturia two or three times a night and increased frequency by day. The symptoms which he complained of during the two months prior to entry, including those referable to his gastro-intestinal tract as well as his fatigue, can very well be explained on the basis of an increasing retention of nitrogenous products which would normally be excreted by the kidney. The history itself even suggests that we may have been dealing with colitis, which we see in patients in the terminal stage of Bright's disease or uremia.

His physical examination certainly is perfectly consistent with a diagnosis of uremia. The laboratory data that we have are those of

failure to concentrate urine, the specific gravity being recorded as 1.012. He has a very definite anemia, which is what we would expect if we were dealing with a chronic progressive glomerular nephritis. He has a leukocytosis with a high blood count, which is not what we should expect in uremia or in the anemia associated with chronic Bright's disease, but he evidently has some acute process going on which started twenty-four hours prior to his entrance. He has a definite elevation of non-protein nitrogen, a very high one in fact, 190, and a definite reduction in carbon dioxide, showing that he has the acidosis which we see in a terminal stage of nephritis.

The one doubtful point is the note in the past history that five years prior to entrance he had been treated for abdominal pain and was supposed to have passed gravel. I suppose it is conceivable that the man may have had gradually increasing kidney calculi with enough subsequent destruction to the kidney tissue to give him a gradually increasing impairment of kidney function, and that his terminal state might have represented such a condition, because as we know, renal calculi, particularly the larger ones, can be present for years without symptoms and are sometimes detected only on routine x-ray examination of the abdomen for one cause or another.

I think however it would be much safer to stick to a diagnosis of uremia due to a progressive chronic glomerular nephritis. He probably had an associated colitis. A pericarditis was revealed on physical examination. Of course we know that pericarditis is found in uremia but it is not associated with pain of the severity of which this man complained. Therefore I should be inclined to place considerable emphasis on this sudden attack of pain in the lower chest associated with increasing dyspnea. He had no signs of failure. This I believe could probably best be interpreted as being due to coronary disease or coronary occlusion, and I should be inclined to think that his pericarditis was secondary to that rather than associated with a terminal uremia.

He had a temperature of 101°, a pulse of 102, and nothing more on physical examination to enable me to say with certainty that we are dealing with a coronary occlusion. The heart sounds were of good quality, there was no gallop rhythm, r - - - - - alternans or other findings which we might expect with coronary occlusion. The blood pressure was 170/80, but we have no assurance that two weeks previously it was not 250/140 or something of that sort.

Therefore I should be inclined to say that this man had uremia secondary to a chronic glomerular nephritis, that he had arteriosclerosis and probably a coronary occlusion. There is a possibility that these findings may have been due to kidney obstruction secondary to the presence of

demonstrating tubercle bacilli, a thing which would be pretty difficult

The autopsy findings showed that the anastomosis, as was of course known, had broken down. The terminal portion of the ureter had slipped entirely away from its connection to the sigmoid and infection had developed

The opposite kidney was a very large one, weighing 275 grams. That was probably in part compensatory hypertrophy for the complete destruction of the first kidney, but was partly due to diffuse infection. At the time of gross examination it was thought to be tuberculous, but microscopic examination shows multiple small abscesses with no trace of tuberculosis. The nephritic abscesses were regarded as a secondary infection from his bladder. The bladder tumor itself was unusual in character. It was a complete ring that encircled the entire bladder slightly above the trigonum and practically bisected the bladder into two parts, a small bladder below and a small bladder above, with a very minute connection between the two.

DR. SMITH Do you remember if he had distant metastases?

DR. MALLORY None was found anywhere

DR. HOLMES Did the tumor involve the adrenals, or were they destroyed in any way?

DR. MALLORY The left adrenal did show some areas of calcification

DR. HOLMES Was the left ureteral orifice involved by the tumor?

DR. MALLORY No, the tumor was above the trigonum

A PHYSICIAN What are those areas of calcification in the pelvis?

DR. MALLORY That I cannot tell you. We did not notice anything at the time of autopsy. He did have a few calcified lesions in his lungs and one or two lymph nodes in the retroperitoneal tissues. We did not examine the pelvis.

DR. CHUTE Did you find tuberculosis of the epididymes? They made a note that they were hard.

DR. MALLORY We did not look for that.

A UROLOGIST What was the condition of the remaining kidney?

DR. MALLORY That showed a very diffuse pyelonephritis, a pretty severe one, which was probably the most significant cause of death.

DR. BARNEY Can Dr. Spence tell us what the condition of the right urine was before the anastomosis was done?

DR. SPENCE It showed 0 to 1 white cells.

DR. BARNEY Did it have a good function?

DR. SPENCE It is not recorded, but the total function was good, therefore the function from that kidney must have been

DR. BARNEY As I remember it we took into consideration the possibilities of infection and found it was not present, although the infection you found was undoubtedly a result of my

anastomosis and not something that preceded the anastomosis.

DR. MALLORY Yes, I think I was probably wrong in that. Histologically it is a very acute process unquestionably.

CASE 20082

PRESENTATION OF CASE

A fifty-five year old white married postman entered the Emergency Ward complaining of substernal pain and dyspnea of one day's duration. The history was not very reliable because it was obtained entirely from the patient's sister-in-law. The patient himself was deaf, ill, and not able to give much.

Approximately two months before entry the patient began to feel less well than usual and to lose appetite, but continued to work. His appetite continued to be poor. Eating was associated with considerable eructation of gas but no vomiting. His bowels gradually became constipated. After a week's rest he was able to return to work, but five days before entry he felt nauseated and vomited. Because of increasing fatigue he called his physician, who gave him some pills and a tonic. That evening he had several diarrheal stools containing slimy material. The evening before entry he had severe pain in the lower central part of his chest, a little worse on inspiration but quite constant and without radiation. This pain became steadily worse and breathing became more difficult. He had some dry cough. During the week before admission his output of urine was less than usual and for the sixteen hours previous to entry he was anuric. On the morning of admission he complained of severe frontal headache, which had remained about the same. There was no blurring of vision or edema.

Family history His father was dead. His mother died at fifty-six of heart trouble. Three siblings were living and well. There was no familial history of tuberculosis or cancer.

Marital history He had been married for twenty-nine years. His wife and one child were living and well. There had been no other pregnancies.

Past history Five years before entry he had abdominal pain and was told by his doctor that he had gravel. He had been getting gradually deaf for the past thirty years. Ten or fifteen years before admission he had an abscess in his ear treated at the Eye and Ear Infirmary. He had no chronic discharge. He frequently had head colds, with an occasional nosebleed. For several years past he had had frequency two or three times at night and five or six times a day.

Physical examination showed a sick looking man, mentally hazy but not disoriented. His breath was urinous. There were diffuse twitchings of the muscles and nausea with frequent vomiting. The skin and tongue were dry.

There was moderate sclerosis of the retinal arteries without hemorrhage or exudates. The heart was slightly enlarged, the percussion borders being 9.5 centimeters to the left of the midsternal line and 3 centimeters to the right. The sounds were of fairly good quality, without definite organic murmurs or gallop. There was a loud high-pitched to-and-fro sound all over the precordium, loudest at the base. This was taken to be a friction rub, although it was less rough than one would expect. The blood pressure was 170/80. There was very slight non-pitting edema of the feet. The bladder dullness extended two thirds of the way to the umbilicus. The chest was clear except for a few moist râles at the bases.

The temperature was 101°, the pulse 102. The respirations were 30.

Examination of the urine showed a specific gravity of 1.012, a trace of albumin and occasional red blood cells, epithelial cells and bacteria. A catheter specimen showed colon bacillus. Examination of the blood showed a red cell count of 2,400,000, with a hemoglobin of 45 per cent. The white cell count was 17,700, with 95 per cent polymorphonuclears. Examination of the stools showed them to be of liquid consistency and alkaline reaction, with a two plus guaiac. The non-protein nitrogen was 190 milligrams, the carbon dioxide combining power 24 per cent.

The patient was given 1500 cubic centimeters of normal saline subcutaneously and morphia p.r.n. His course was progressively downhill. In spite of intravenous glucose and daily clysis of normal saline he put out very little urine. He was seen by a urological consultant, who found no obstruction to account for the retention and apparent uremia. The patient failed rapidly and died five days after admission to the Emergency Ward.

DIFFERENTIAL DIAGNOSIS

DR. WALTER BAUER. There is obviously not much doubt that we were dealing with a patient who had uremia, and in reconstructing the story I think we can say that he showed evidence of impaired kidney function going back over a period of at least several years.

He had a history of nocturia two or three times a night and increased frequency by day. The symptoms which he complained of during the two months prior to entry, including those referable to his gastro-intestinal tract as well as his fatigue, can very well be explained on the basis of an increasing retention of nitrogenous products which would normally be excreted by the kidney. The history itself even suggests that we may have been dealing with colitis, which we see in patients in the terminal stage of Bright's disease or uremia.

His physical examination certainly is perfectly consistent with a diagnosis of uremia. The laboratory data that we have are those of

failure to concentrate urine, the specific gravity being recorded as 1.012. He has a very definite anemia, which is what we would expect if we were dealing with a chronic progressive glomerular nephritis. He has a leukocytosis with a high blood count, which is not what we should expect in uremia or in the anemia associated with chronic Bright's disease, but he evidently has some acute process going on which started twenty-four hours prior to his entrance. He has a definite elevation of non-protein nitrogen, a very high one in fact, 190, and a definite reduction in carbon dioxide, showing that he has the acidosis which we see in a terminal stage of nephritis.

The one doubtful point is the note in the past history that five years prior to entrance he had been treated for abdominal pain and was supposed to have passed gravel. I suppose it is conceivable that the man may have had gradually increasing kidney calculi with enough subsequent destruction to the kidney tissue to give him a gradually increasing impairment of kidney function, and that his terminal state might have represented such a condition, because as we know, renal calculi, particularly the larger ones, can be present for years without symptoms and are sometimes detected only on routine x-ray examination of the abdomen for one cause or another.

I think however it would be much safer to stick to a diagnosis of uremia due to a progressive chronic glomerular nephritis. He probably had an associated colitis. A pericarditis was revealed on physical examination. Of course we know that pericarditis is found in uremia but it is not associated with pain of the severity of which this man complained. Therefore I should be inclined to place considerable emphasis on this sudden attack of pain in the lower chest associated with increasing dyspnea. He had no signs of failure. This I believe could probably best be interpreted as being due to coronary disease or coronary occlusion and I should be inclined to think that his pericarditis was secondary to that rather than associated with a terminal uremia.

He had a temperature of 101°, a pulse of 102, and nothing more on physical examination to enable me to say with certainty that we are dealing with a coronary occlusion. The heart sounds were of good quality, there was no gallop rhythm, no cannon alternans or other findings which we might expect with coronary occlusion. The blood pressure was 170/80, but we have no assurance that two weeks previously it was not 250/140 or something of that sort.

Therefore I should be inclined to say that this man had uremia secondary to a chronic glomerular nephritis, that he had arteriosclerosis and probably a coronary occlusion. There is a possibility that these findings may have been due to kidney obstruction secondary to the presence of

demonstrating tubercle bacilli, a thing which would be pretty difficult

The autopsy findings showed that the anastomosis, as was of course known, had broken down. The terminal portion of the ureter had slipped entirely away from its connection to the sigmoid and infection had developed.

The opposite kidney was a very large one, weighing 275 grams. That was probably in part compensatory hypertrophy for the complete destruction of the first kidney, but was partly due to diffuse infection. At the time of gross examination it was thought to be tuberculous, but microscopic examination shows multiple small abscesses with no trace of tuberculosis. The nephritic abscesses were regarded as a secondary infection from his bladder. The bladder tumor itself was unusual in character. It was a complete ring that encircled the entire bladder slightly above the trigonum and practically bisected the bladder into two parts, a small bladder below and a small bladder above, with a very minute connection between the two.

DR SMITH: Do you remember if he had distant metastases?

DR MALLORY: None was found anywhere.

DR HOLMES: Did the tumor involve the adrenals, or were they destroyed in any way?

DR MALLORY: The left adrenal did show some areas of calcification.

DR HOLMES: Was the left ureteral orifice involved by the tumor?

DR MALLORY: No, the tumor was above the trigonum.

A PHYSICIAN: What are those areas of calcification in the pelvis?

DR MALLORY: That I cannot tell you. We did not notice anything at the time of autopsy. He did have a few calcified lesions in his lungs and one or two lymph nodes in the retroperitoneal tissues. We did not examine the pelvis.

DR CHUTE: Did you find tuberculosis of the epididymes? They made a note that they were hard.

DR MALLORY: We did not look for that.

A UROLOGIST: What was the condition of the remaining kidney?

DR MALLORY: That showed a very diffuse pyelonephritis, a pretty severe one, which was probably the most significant cause of death.

DR BARNEY: Can Dr. Spence tell us what the condition of the right urine was before the anastomosis was done?

DR SPENCE: It showed 0 to 1 white cells.

DR BARNEY: Did it have a good function?

DR SPENCE: It is not recorded, but the total function was good, therefore the function from that kidney must have been.

DR BARNEY: As I remember it we took into consideration the possibilities of infection and found it was not present, although the infection you found was undoubtedly a result of my

anastomosis and not something that preceded the anastomosis.

DR MALLORY: Yes, I think I was probably wrong in that. Histologically it is a very acute process unquestionably.

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Therefore I should be inclined to say that this man had uremia secondary to a chronic glomerular nephritis, that he had arteriosclerosis and probably a coronary occlusion. There is a possibility that these findings may have been due to kidney obstruction secondary to the presence of

renal calculi This possibility however is very remote

Certainly we should always think of the possibility of polycystic kidney, but here again we have nothing to substantiate such a diagnosis, there being nothing in the history or the physical examination to suggest it

DR TRACY B MALLORY Are there any other suggestions as to diagnosis?

DR J H MEANS I think his bladder is rather puzzling I do not see why it was overdistended If he had an oliguria due to kidney disease and no obstruction in his urinary tract lower down he ought to have had an empty bladder We are told there was no mechanical cause I wonder if there was any other kind of cause why he could not empty his bladder, and I wonder, granting that he had a chronic kidney lesion, if perhaps the bladder was more in the nature of a cause than an effect, whether because he could not empty his bladder he got some back pressure and that gave him uremia with a kidney of low function existing previously I wonder if he had tabes or any other neurologic cause for his inability to empty his bladder I should like to know what happened after he emptied it

DR MALLORY Can you tell us, Dr Trevett?

DR LAURENCE D TREVETT He was catheterized but did not improve

DR MALLORY You found no obstruction?

DR TREVETT No

DR MEANS Did the bladder fill up again?

DR TREVETT He was putting out very little urine

DR EDWARD L YOUNG, JR How much did you get when you catheterized him?

DR TREVETT We took out only ten ounces

DR MALLORY Have you anything to add, Dr Smith?

DR WILLIAM D SMITH As Dr Bauer said, the uremia is obvious As to the matter of urinary obstruction, in view of his history of possible stone and his retained urine in the bladder I asked Dr Colby to see him and clear that up The real diagnostic problem I felt was a differentiation between the end stage of a chronic glomerular nephritis and a vascular nephritis on a background of prolonged hypertension and arteriosclerosis I guessed wrong as a matter of fact The man's age was more compatible with vascular nephritis It would have been more likely to be glomerular nephritis if he had been ten years younger Furthermore there was no history in the past to suggest any acute or sub-acute glomerular nephritis At the same time I guessed it was glomerular nephritis just as Dr Bauer did, and I think mainly because he had this final uremia and because in my experience it is somewhat unusual for vascular nephritis secondary to hypertension and arteriosclerosis to end in uremia Cardiac symptoms and cerebral symptoms are very much more common and uremia more uncommon Another factor that turned me toward a diagnosis of chronic

glomerular nephritis was the extreme grade of anemia, which I felt to be more characteristic of a glomerular nephritis My diagnosis was like Dr Bauer's, that it was the end stage of a chronic glomerular nephritis

I did not feel that there was any question of coronary thrombosis I felt that the pericarditis was the typical pericarditis that we get in persons dying of uremia and chronic nephritis The fact that he had muscular twitchings and finally a generalized convulsion would I think be against the obstructive type of uremia Is that right, Dr Colby? Would obstructive uremia give a different picture?

DR FLETCHER COLBY Yes

DR SMITH I made a diagnosis of chronic glomerular nephritis, terminal uremia and pericarditis

DR COLBY We might seem a bit confused about the lowered renal function from nephritis and obstructive lesions or surgical lesions of the kidney more frequently than we apparently are. This is rather a good example of that I think. In other words, as the patient's history is taken and physical examination is done, as a general rule there is little question in one's mind as to whether the patient is suffering from a nephritis, call it a medical nephritis, chronic glomerular nephritis, or nephritis caused by an obstructive lesion possibly with infection secondary I think the reason is that in the obstructive lesions the symptoms are so very definite In this case if the patient had had a low renal function as the end result of calculus or an enlarged prostate, with gradually failing kidney function, the obstructive symptoms from the enlarged prostate would have been predominant and the patient would have given a very definite history of difficulty in urination rather than simply of the frequency in nephritis If the nephritis is due to calculous disease that is usually perfectly evident One kidney may have been completely obstructed for a long time and have gone to pieces, the other kidney may have been partially obstructed by a stone for a considerable length of time, there may have been bilateral infection, and yet the non-protein nitrogen will stay low in these cases for a surprisingly long time, until the patient is in the terminal stages We have such a patient in the hospital now One kidney is a large pyonephrotic sac, the other has been obstructed for a long time by a stone in the ureter While the patient is in very poor shape, weighs eighty pounds, and has been very septic for a long time, the non-protein nitrogen is 23 So that this differentiation between the nephritis of obstructive etiology and the usual nephritis very seldom comes up

As I remember this man, there was no evidence at all by rectum or through the cystoscope of any real enlargement of the prostate such as would cause his symptoms The reason he did not empty his bladder when he came in I think was probably general weakness Any patient

with a non-protein nitrogen of 190 is in pretty bad shape. As I remember, after he was catheterized he had no further difficulty in emptying the bladder of the urine that the kidneys could secrete

DR YOUNG I perhaps am expressing my ignorance of medical conditions I ran into a situation somewhat similar to this two months ago A patient of about sixty could not empty his bladder In the end it appeared that the anuria which he had was due to a drop in blood pressure from an unrecognized coronary thrombosis Because of the drop in blood pressure the kidneys did not shoot things through and he developed an anuria due to that I had not appreciated that situation before Perhaps it is a well known condition to the medical man

DR SMITH It is entirely possible Any man as sick as that may not void. I have seen distended bladders in typhoid and pneumonia Any person who is as sick as this man can perfectly well have a bladder not distended, or distended

DR COLBY His blood pressure was 170

CLINICAL DIAGNOSES

Chronic glomerular nephritis

Uremia.

Terminal pericarditis

ANATOMIO DIAGNOSES

Chronic vascular nephritis

(Uremia)

Cardiac hypertrophy and dilatation, hypertensive type.

Acute fibrinous pericarditis with effusion

Hydrothorax, bilateral

Ascites, slight

Arteriosclerosis, moderate aortic and renal, slight coronary

Cholesterosis of the gall bladder, slight.
Trigonitis

PATHOLOGIC DISCUSSION

DR MALLORY The autopsy showed a pair of kidneys weighing 200 grams, which is two-thirds of the normal weight The capsules stripped fairly readily and left granular rather grayish surfaces The cortex was considerably narrowed, down to 3 millimeters, about half the normal thickness

Microscopic examination shows hyalinization of about five-sixths, we estimated, of all his glomeruli and very extensive sclerotic lesions In none of the glomeruli are there any epithelial crescents or anything to suggest an active glomerular process The possibility of glomerular nephritis in the past could not be absolutely ruled out, although I am inclined to think there is no need of supposing it The average glomerular nephritic dying in terminal uremia winds up with a pair of kidneys weighing less than 150 grams, often less than 100 grams, much more atrophic than these were It seems to me that everything is pretty well explained by nephrosclerosis

The pericarditis was an acute fibrinous one with massive shaggy exudate over both surfaces, very much more severe than the ordinary pericarditis found in either coronary thrombosis or uremia His coronaries showed a moderate degree of sclerosis, but there was no infarction. I think unquestionably that the substernal pain must have been due to pericarditis, although my impression was very much like Dr Bauer's, that it is not usual in uremia to have as definite a pain as that

DR BAUER I have never seen it

A PHYSICIAN What was the bacteriology?

DR MALLORY Our cultures were sterile

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BIRTH CONTROL AND NATIONAL RECOVERY

THE prominence which the movement in favor of Birth Control has achieved in America is illustrated by the Conference on this topic which was held in Washington on January 15, 16 and 17. The meeting occupied three days and counted among its speakers some of the best known medical men, sociologists and economists in the country. A glance at the program gives one an idea of the broad contacts of Birth Control. On the first afternoon, national and international population problems were considered, in the evening, religious, ethical and moral aspects of Birth Control, on the second day, a special medical session was held. This included papers on Medical Indications for Contraception, Is the Safe Period Safe?, Ovulation Time in Woman, The Endocrine Control of the Uterus, Immunity as a Method of Birth Control, Abortions, Sterilization, and Contraceptive Technique.

Another session was devoted to consideration

of the social and economic phases, including a discussion of the growing burden of charity costs, unemployment, social planning, and the place of Birth Control in a Public Health Program. Legislation pending in Congress which would amend a sixty year old law to permit dissemination of birth control information by physicians was the theme of the dinner and the closing session.

It is encouraging to think that a discussion of these problems may be undertaken in this country, and that so many intelligent people are interested in them. Such conferences have been held in England and the Continental countries for a number of years. As to the relationship between Birth Control and National Recovery, one may wonder whether linking these subjects together is not making the most of an opportunity. In the long run, national prosperity and international amity may well depend upon population control, but let us hope that recovery from the depression will be well on its way long before the echoes of this present conference become merged in the fund of common knowledge.

AN IMPORTANT BILL

IN the report of the Committee on State and National Legislation submitted to the Council of the Massachusetts Medical Society, February 7, emphasis was placed on the importance of House Bill 118, the essential features of which are set forth on pages 1366, 1367, and 1368 of the December 28, 1933 issue of this Journal.

One reason for the enactment of amendments to the present law is that Massachusetts stands in the deplorable position of having the most defective legal requirements respecting medical education and licensure in this country. This carries the implication that this Commonwealth may now admit to medical practice, physicians who have not had the advantages of reasonably good preparation for dealing with the illnesses of her citizens. The greatest and most costly disasters are imposed by disease. By a simple amendment to the present law, the State may raise the average efficiency of medical service. Under this law, the only premedical educational experience of a candidate for registration in medicine in this State is that he must have taken courses equivalent to those required for graduation from a high school. Even this is indefinite, and, when it deals with medical education, all that is required is graduation from a legally chartered medical school having the power to confer degrees in medicine, after attendance on a four year course of a specified number of months.

Even with these loose requirements there is no provision whereby the quality of instruction in a medical school shall be subject to approval by a competent body. There is no guar-

antee that a medical school may not become a diploma mill.

Outside of Massachusetts the country has been gradually emerging from the chaotic conditions respecting medical schools of thirty years ago, so that at the present time every other State in the Union has the power to accept or reject the applications of graduates of medical schools under the authority of its several boards of registration. In other words, the boards of the more progressive States can determine whether a given medical school has met the requirements of the States under which such officials operate. The situation in Massachusetts is that neither the Department of Education nor the Board of Registration in Medicine has any authority to examine medical schools to determine the quality of instruction given in their institutions.

The strange and incongruous attitude of our Legislature toward medical education is emphasized by the fact that the Board of Registration of Nurses is given power to evaluate the standing of schools of nursing and can govern its acceptance of graduates for examination by its classification of these schools.

For many years appeals have been made to our Legislature for the enactment of a law which would place Massachusetts on a parity with other states with respect to a classification of medical schools.

The Legislature has resolutely denied the most important request of the Board of Registration in Medicine for amendatory acts, and graduates of any legally chartered medical school as specified above can appear for examination.

A medical school charter gives no assurance of approved quality of instruction according to standards adopted by the recognized evaluating body of this country. Aside from the question of what quality of medical service the State should approve, that of the predicament of a graduate of a substandard school is significant because he may find, after four or five years of attendance in a certain school, that the doors to medical practice in the several states are closed to him with one exception.

History shows that the operation of the Council on Medical Education has been most helpful to medical schools in stimulating progress respecting methods and quality of instruction, with the result that with a very few exceptions the doors of these institutions are open to inspection. The unrecognized schools apparently do not wish for assistance in improving their curricula.

The Massachusetts situation calls loudly for reform, but what is the likelihood of progress?

The situation appears to be that comparatively few of our voters have any effective concern about existing conditions and the opposition is united, has worked, and probably will work, against any favorable change in the law.

The name of one member of the legislative committee which last year considered requests for legislation, appears as Dean of the Faculty of a medical school, representatives of which have recorded opposition to the bill drafted by the Secretary of the Board of Registration in Medicine. This Dean sat on the committee at the hearing.

In some sections of the State, physicians have tried to create in the minds of our Senators and Representatives interest in this bill, but only united action is likely to be effective. If the bill is defeated, it will be another demonstration of the indifference of a large proportion of the doctors of the State. Five thousand doctors with a united will would impress the Legislature.

It should be known that House Bill 755 on the petition of C. Ruggles Smith, is in opposition to the features of House Bill 118 sponsored by the Board of Registration in Medicine. Mr. C. Ruggles Smith's name appears in the faculty list of the Middlesex College of Medicine and Surgery.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

CATTELL, RICHARD B. A.B., M.D. Harvard University Medical School 1925. F.A.C.S. Surgeon at the Lahey Clinic, New England Deaconess Hospital and New England Baptist Hospital. Address 605 Commonwealth Avenue, Boston. Associated with him is

LAHEY, FRANK H. M.D. Harvard University Medical School 1904. F.A.C.S. Director, Lahey Clinic. Surgeon-in-Chief, New England Baptist Hospital. Surgeon, New England Deaconess Hospital. Address 605 Commonwealth Avenue, Boston. Their subject is "The Operative Management of Cancer of the Rectum" Page 403.

CORRIGAN, JOHN C. A.B., M.D. Tufts College Medical School 1931. Formerly Assistant Physician, South Department for Contagious Diseases, Boston City Hospital. Resident Physician, First and Third Medical Services Boston City Hospital. Teaching Fellow in Medicine, Tufts College Medical School. Address Boston City Hospital, Boston. Associated with him is

SCHILLER, IRVING W. M.D. Tufts College Medical School 1930. Formerly Assistant Resident Physician, Boston Sanatorium. Resident Physician, First and Third Medical Services, Boston City Hospital. Teaching Fellow in Medicine, Tufts College Medical School. Address 311 Commonwealth Avenue, Boston. Their subject is "Sickle Cell Anemia. A Report of Eight Cases, One with Necropsy" Page 410.

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BIRTH CONTROL AND NATIONAL RECOVERY

THE prominence which the movement in favor of Birth Control has achieved in America is illustrated by the Conference on this topic which was held in Washington on January 15, 16 and 17. The meeting occupied three days and counted among its speakers some of the best known medical men, sociologists and economists in the country. A glance at the program gives one an idea of the broad contacts of Birth Control. On the first afternoon, national and international population problems were considered, in the evening, religious, ethical and moral aspects of Birth Control, on the second day, a special medical session was held. This included papers on Medical Indications for Contraception, Is the Safe Period Safe?, Ovulation Time in Woman, The Endocrine Control of the Uterus, Immunity as a Method of Birth Control, Abortions, Sterilization, and Contraceptive Technique.

Another session was devoted to consideration

of the social and economic phases, including a discussion of the growing burden of charity costs, unemployment, social planning, and the place of Birth Control in a Public Health Program. Legislation pending in Congress which would amend a sixty year old law to permit dissemination of birth control information by physicians was the theme of the dinner and the closing session.

It is encouraging to think that a discussion of these problems may be undertaken in this country, and that so many intelligent people are interested in them. Such conferences have been held in England and the Continental countries for a number of years. As to the relationship between Birth Control and National Recovery, one may wonder whether linking these subjects together is not making the most of an opportunity. In the long run, national prosperity and international amity may well depend upon population control, but let us hope that recovery from the depression will be well on its way long before the echoes of this present conference become merged in the fund of common knowledge.

AN IMPORTANT BILL

In the report of the Committee on State and National Legislation submitted to the Council of the Massachusetts Medical Society, February 7, emphasis was placed on the importance of House Bill 118, the essential features of which are set forth on pages 1366, 1367, and 1368 of the December 28, 1933 issue of this *Journal*.

One reason for the enactment of amendments to the present law is that *Massachusetts* stands in the deplorable position of having the most defective legal requirements respecting medical education and licensure in this country. This carries the implication that this Commonwealth may now admit to medical practice, physicians who have not had the advantages of reasonably good preparation for dealing with the illnesses of her citizens. The greatest and most costly disasters are imposed by disease. By a simple amendment to the present law, the State may raise the average efficiency of medical service. Under this law, the only premedical educational experience of a candidate for registration in medicine in this State is that he must have taken courses equivalent to those required for graduation from a high school. Even this is indefinite, and, when it deals with medical education, all that is required is graduation from a legally chartered medical school having the power to confer degrees in medicine, after attendance on a four-year course of a specified number of months.

Even with these loose requirements there is no provision whereby the quality of instruction in a medical school shall be subject to approval by a competent body. There is no guar-

and typhoid fever produce poisons in the body which seriously affect the heart during the course of the disease but if the patient recovers from the infection, no serious damage results and the heart is able to function normally and efficiently through a long life. The number in which permanent impairment occurs is extremely small. Not so when rheumatic fever invades the body since about seventy per cent of its victims suffer lasting cardiac effects. Reduce rheumatic fever, and you reduce heart disease. The importance of this has been shown by the statistics of Dr. Haven Emerson in which he says that when rheumatism completes its cycle from onset through a period of disabling symptoms to and through the time of decompensation, among those under the age of forty (in which period occurs the majority of cases of rheumatism) we find that the onset is under ten years in 19 per cent of the cases, between ten and twenty years of age in 37 per cent, between twenty and thirty years in 23 per cent, and between thirty and forty years in 21 per cent, so you will see that the greatest incidence of rheumatic fever and its cardiac complications occur in the second decade of life. On the average four years elapse between onset and cardiac disability which continues in varying degrees for about seven years before some signs of heart failure appear.

Naturally there are great variations in degree and duration of the symptoms but the result is eventually the same. While valvular disease is the rule, rheumatic fever in early life doubtless plays a considerable part in the heart degenerations of middle life. Of great importance are the studies, of Winternitz of Yale and others, of the diseases of the arteries and veins in such infections as rheumatic fever. This study has a distinct bearing upon the heart muscle degeneration and high blood pressure cases of middle life which appear to have escaped rheumatic valvular disease in the earlier years. Chronic rheumatism with its disfiguring deformities does not concern us in this talk since it rarely attacks the heart.

Unfortunately for us the definite bacterium of rheumatic fever has not been discovered, so that there is no vaccine or serum which can be used either in the immunization of patients against the disease or in its treatment. A serum has recently been tried in rheumatic fever but it is as yet too new to warrant any statement concerning its value. Even if a potent serum should come into general acceptance, its effectiveness would still be considerably reduced if foci of infection were allowed to remain in the body pouring out their poisons into the blood stream. The most prominent foci are diseased tonsils, infected teeth and any cavity harboring pus organisms. Pus-containing tonsils giving repeated attacks of tonsillitis, vague pain in the joints, fever and evidences of ill health should be removed, if possible, before the heart becomes involved. In the opinion of many physicians today, procrastination on the part

of tonsillitis patients, or a doubt of the value of tonsillectomy, has been responsible for heart damage which has ruined the lives of many individuals. In some cases of rheumatic fever where the tonsils are proved to be at fault, and where all medical treatment has failed, we have performed tonsillectomy even in the presence of inflamed joints and high fever with the almost immediate cessation of the disease and this without any untoward results or complications. Infected teeth are less responsible for rheumatic heart disease than tonsils but good and regular care of the teeth unquestionably will reduce the incidence from this cause.

Another source of heart disease is found in the social diseases, most important of which is syphilis. Its effect upon the heart may be acute or chronic and its progress insidious. The parasite of syphilis attacks the heart muscle and more particularly the aorta and aortic valve. Regurgitation of blood through the aortic valve in a child is often the result of rheumatism but in a middle-aged man it is frequently due to syphilis. Ten to twenty years after the initial lesion, the syphilitic heart gives its first sign of distress, incapacitates the sufferer and closes a life which should have seen twenty or thirty years more of usefulness. Much has been done to prevent syphilitic cardiac disease by early diagnosis and prompt, thorough and efficient treatment but notwithstanding these resources some do not escape. Is it any wonder that the United States Public Health Service and other organizations are doing all in their power to stamp out this menace by various educational methods? A long forgotten initial lesion may appear later under the clinical mask of diseases of other structures but may fail to present any definite clinical symptoms of syphilis so that it behooves the physician to be on the lookout for this disease and thus save the patient from its damaging results. Then too, the patient should reveal his past history in order that his life may not be ruined by a vascular disorder which can be arrested by proper treatment if taken in time. The physician must not be blinded by social position or uprightness of character in the patient or forgetfulness of a youthful misfortune.

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SHORT, JAMES J. M.D. University of Buffalo 1918 Assistant Professor of Medicine, New York Post-Graduate Medical School, Columbia University Associate Attending Physician, New York Post-Graduate Hospital Consulting Physician, Department of Correction, New York City Director of Laboratories, Life Extension Institute, New York City Address 580 Park Avenue, New York City Associated with him is KELLEY, MARGARET F. B.A., M.A. Columbia University 1914 Formerly, New York City Department of Health, Bacteriology and Clinical Pathology Now Associate Director of Laboratories, Life Extension Institute, New York City 1924 Address Life Extension Institute, Inc., 25 W. 43rd Street, New York City Their subject is "Incidence of Syphilis in the General Population and a Comparison of the Kahn and Wassermann Tests" Page 417

EMERY, EDWARD S., JR. A.B., M.D. Harvard University Medical School 1920 Associate in Medicine, Peter Bent Brigham Hospital Instructor in Medicine, Harvard Medical School His subject is "The Relative Value of Symptoms versus the X-ray and Oesophagoscope in the Early Diagnosis of Carcinoma of the Oesophagus" Page 420 Address 319 Longwood Avenue, Boston

DAVIS, MAX A.B., D.N.B., M.D. Harvard University Medical School 1925 F.A.C.S. Instructor in Obstetrics and Gynecology at Boston University School of Medicine First Assistant Obstetrician, Massachusetts Memorial Hospitals Visiting Gynecologist to O.P.D., Massachusetts Memorial Hospitals His subject is "A New Method for the Prediction of the Sex of the Fetus" Page 421 Address 311 Commonwealth Avenue, Boston

ADAMS, BENJAMIN D. M.D. University of Vermont College of Medicine 1908 F.A.C.S. Assistant Professor of Surgery, University of Vermont College of Medicine Attending Proctologist, Mary Fletcher Hospital, Burlington, Fanny Allen Hospital, Winooski, Consulting Proctologist, Bishop de Goesbriand Hospital, Burlington His subject is "Device for Fixation of Hands and Arms for Certain Operative Cases" Page 423 Address 266 Main Street, Burlington, Vermont

ROCKWELL, JOHN A. S.B., M.D. Boston University School of Medicine 1899 His subject is "Lest We Forget" Page 424 Address 24 Garden Street, Cambridge, Massachusetts

MASSACHUSETTS LEGISLATIVE NOTES

S 162 It should not be forgotten that Senate 162 is a bill to license chiropractors. It is very similar to those bills which have been in evidence heretofore.

No assignment for hearing has appeared in the legislative bulletin.

H 118 Recommendations of the Board of Registration in Medicine relative to the educational qualifications of applicants for registration as qualified physicians. This bill has been referred to in these columns, and should create an active interest in the minds of physicians throughout the State. It has not been assigned for hearing.

H 147 Defining and relating to narcotic drugs, etc., has been assigned for hearing March 1.

H 293 Relative to the sale of drugs, medicines, chemicals and poisons, will be heard March 1.

H 294 Which relates to the prohibition of persons not conducting licensed drug stores from using certain designating terms or words will be heard March 1.

H 896 Special attention should be given to the attempt to do away with the compulsory vaccination of school children. This bill will be heard March 6, and H 1198, for the establishment of a board of examination and registration to regulate the practice of magnetic healers, will be heard March 7.

H 524 was considered by the Legislative Committee on Education on February 15. This bill is designed to give to the University of Massachusetts authority to grant the usual University and College degrees.

Dr. Payson Smith, State Commissioner of Education, and Dr. Stephen Rushmore, Secretary of the Board of Registration in Medicine, opposed the grant of this authority.

MISCELLANY

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

HEART DISEASE IN MIDDLE AGE*

BY WILLIAM H. ROBEX, M.D.

It is difficult to separate heart disease as it occurs in young and middle-aged adults from that of children, for the simple reason that many of the abnormal heart conditions seen in the later decades of life have their origin in youth.

With the exception of congenital heart disease—a structural defect found at birth representing a very small per cent—children are born with normal hearts which become diseased as a part of the infections of early life. The chief infection affecting the heart is rheumatic fever and its allied conditions, tonsillitis, St. Vitus' dance and diseased teeth. Diphtheria, scarlet fever, pneumonia

*Station WBZ November 24 1933 4 30 P.M.

and typhoid fever produce poisons in the body which seriously affect the heart during the course of the disease but if the patient recovers from the infection, no serious damage results and the heart is able to function normally and efficiently through a long life. The number in which permanent impairment occurs is extremely small. Not so when rheumatic fever invades the body since about seventy per cent of its victims suffer lasting cardiac effects. Reduce rheumatic fever, and you reduce heart disease. The importance of this has been shown by the statistics of Dr. Haven Emerson in which he says that when rheumatism completes its cycle from onset through a period of disabling symptoms to and through the time of decomposition, among those under the age of forty (in which period occurs the majority of cases of rheumatism) we find that the onset is under ten years in 19 per cent of the cases, between ten and twenty years of age in 37 per cent, between twenty and thirty years in 23 per cent, and between thirty and forty years in 21 per cent, so you will see that the greatest incidence of rheumatic fever and its cardiac complications occur in the second decade of life. On the average four years elapse between onset and cardiac disability which continues in varying degrees for about seven years before some signs of heart failure appear.

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general health and can often be cleared away by a simple and straightforward explanation.

Take for example the rapid or irregular heart of goitre. The heart is rapid because it is being overstimulated by too much thyroid secretion. Physicians are able to recognize this condition before the heart becomes worn out by the poisons of an increased thyroid gland, and successfully treat it.

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COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1932 AND SEVEN YEAR AVERAGE

MONTH ENDING JANUARY 6, 1934

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Anthrax	—	—	—	—	—	—	—	1	—
Cerebrospinal Men	—	—	—	—	—	—	1	—	2
Chicken Pox	155	103	84	160	131	83	191	73	164
Conjunctivitis Inf	—	1	—	11	—	—	7	—	1
Diphtheria	10	2	7	2	21	5	15	6	14
Encephalitis Epid	1	—	—	—	—	—	—	—	1
German Measles	2	1	—	2	9	1	1	—	—
Influenza	4	5	23	13	131	13	24	96	89
Measles	17	5	3	21	128	13	18	27	84
Mumps	104	45	41	116	50	61	52	25	73
Paratyphoid Fever	—	—	—	—	—	2	1	—	—
Pneumonia (Broncho)	44	39	35	53	39	28	18	42	50
Pneumonia (Lobar)	62	51	50	64	54	41	50	32	58
Poliomyelitis	—	—	—	—	—	—	1	—	—
Scarlet Fever	55	50	48	63	72	63	83	110	91
Septic Sore Throat	4	3	2	1	2	—	—	2	—
Smallpox	—	—	—	—	4	—	13	6	—
Trichinosis	—	1	—	—	—	—	3	2	—
Tuberculosis (Pul)	21	25	8	13	31	20	26	22	26
Tuberculosis (O F)	—	2	4	1	2	—	7	4	1
Typhoid Fever	—	—	1	—	4	—	2	—	—
Undulant Fever	1	—	—	—	—	—	—	—	1
Whooping Cough	45	44	26	35	56	39	94	75	100
Gonorrhea	64	26	14	21	29	14	17	19	16
Syphilis	48	39	37	32	32	34	29	36	35

Remarks No cases of Asiatic cholera, glanders, plague, or yellow fever during the past seven years.

THE INDIANA PLAN FOR EMERGENCY
MEDICAL AID TO THE INDIGENT*

Emergency medical aid to the indigent is a proper charge against poor relief funds. Various practices have been followed by the townships of Indiana, including contracts with individual physicians and township and county medical societies, payment in a lump sum, or on a fixed schedule of fees, or use of some or all the physicians of a township without contract but on an agreed fee basis, or subject to whatever fees are customarily charged by the physician in question.

The amount of medical aid has ranged to the extremes of care for chronic or even supposed ailments, and surgical operations, the need for which was not acute but of long standing to practically no effort to provide even emergency medical aid.

The Governor's Commission on Unemployment Relief finds considerable difficulty existing in a number of local relief situations through disagreements or controversies over medical aid. It has conferred with a number of local relief groups and with representatives of physicians for the purpose of attempting to work out a plan which would in general eliminate the causes of controversy and at the same time assure adequate emergency medical aid at a reasonable cost.

As a result of this study it proposes, therefore, the following principles and recommends that local relief agencies use them as a basis for working out their own local arrangements on this item of relief.

1. Local public agencies will agree to pay only for such emergency medical aid as is specifically ordered by the agency through its official representatives, and based upon an investigation and proof of need of the applicant for aid.

In cases of emergency, or at such times as it may be impossible or impracticable to communicate with the authorities responsible a physician may respond to a call, attend a case and report such call at the earliest opportunity to the proper authorities who shall then make the investigation as soon as practical.

2. An emergency requiring medical aid shall be deemed to exist where an indigent person is suffering from any *acute* medical or surgical condition requiring treatment for the elimination of pain or restoration of normal activities or any chronic condition requiring treatment for preservation of life. It is recognized that there is considerable difficulty in arriving at a definition of emergency medical aid. It is intended by this definition to put a stop to practices in some townships of paying for surgical operations or medical treatments for disabilities of long standing, and in which no emergency is indicated. For instance, there are reports of hernia operations charged to the town

ship, whereas the disability was known to have existed for a number of years previous to the individual becoming a public charge. Likewise there are reports of tonsillectomies, considerable treatment of persons whose ailment is largely a mental state and for whom medical aid does no good, etc. Such treatments as these should not be ordered by the relief agency. Likewise, it is hoped by this definition to assure treatment for illnesses and surgical conditions that are plainly of an emergency character requiring such treatment to prevent permanent injury or loss of life.

3. It is recognized that the best results from the standpoint of the indigent will be obtained if he is permitted to use his customary physician. This should be made possible under any plan, except that extraordinary expense for travel should not be permitted if there is a physician within a given community qualified to give treatments. In general, this purpose should be sought.

4. The service is most likely to be satisfactory if the local relief agency completes an arrangement with the township or county medical association by which the purpose given in paragraph No 3 can be attained.

5. The method of payment is usually the point of greatest difference. This has given rise to contracts with single or a few physicians within a community as well as to insufficient medical aid where relief authorities have objected to what they believed to be high costs. Two plans are suggested, as follows:

a. Payment on a fee basis. It is reasonable to pay according to the actual service received. However, it is reasonable also to expect that physicians will be willing to accept a fee for poor relief services much lower than their customary fees. This is indicated not only because of the nature of the work itself, but also because the physician has only one debtor for this service and usually will be paid with reasonable promptness. It is suggested that fees to be charged shall not exceed fifty per cent of the average fees charged within a community but that a maximum scale be established which, with possible exceptions, shall not exceed 50 cents for an office call and \$1.00 for home calls with other services in proportion. Exceptions may be arranged also for excessive travel necessary where there is no physician available within a community for needed service.

Any exception to this rule could take place only in those few larger communities of the state where regular office call and home call fees are much above the average. At the low fee of 50 cents an office call and \$1.00 a house call a physician must be expected to supply no drugs or medicines with the possible exception of inexpensive tablets or pills.

b. Payment on a unit contract basis. In some communities it may be advisable not to use the fee basis and this is proposed as an alternative

*Prepared by the Executive Committee of the Indiana State Medical Association and promulgated by William H. Boole, Director of the Governor's Commission on Unemployment Relief. This plan has been approved by the Relief Director at Washington.

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Tuberculosis (Pul)	21	25	8	13	31	20	26	22	26
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Typhoid Fever	—	—	1	—	4	—	2	—	—
Undulant Fever	1	—	—	—	—	—	—	—	1
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THE INDIANA PLAN FOR EMERGENCY MEDICAL AID TO THE INDIGENT*

Emergency medical aid to the indigent is a proper charge against poor relief funds. Various practices have been followed by the townships of Indiana, including contracts with individual physicians and township and county medical societies payment in a lump sum, or on a fixed schedule of fees, or use of some or all the physicians of a township without contract but on an agreed fee basis or subject to whatever fees are customarily charged by the physician in question.

The amount of medical aid has ranged to the extremes of care for chronic or even supposed ailments, and surgical operations, the need for which was not acute but of long standing, to practically no effort to provide even emergency medical aid.

The Governor's Commission on Unemployment Relief finds considerable difficulty existing in a number of local relief situations through disagreements or controversies over medical aid. It has conferred with a number of local relief groups and with representatives of physicians for the purpose of attempting to work out a plan which would in general eliminate the causes of controversy and at the same time assure adequate emergency medical aid at a reasonable cost.

As a result of this study it proposes therefore the following principles and recommends that local relief agencies use them as a basis for working out their own local arrangements on this item of relief.

1. Local public agencies will agree to pay only for such emergency medical aid as is specifically ordered by the agency through its official representatives and based upon an investigation and proof of need of the applicant for aid.

In cases of emergency or at such times as it may be impossible or impracticable to communicate with the authorities responsible, a physician may respond to a call attend a case and report such call at the earliest opportunity to the proper authorities who shall then make the investigation as soon as practical.

2. An emergency requiring medical aid shall be deemed to exist where an indigent person is suffering from any acute medical or surgical condition requiring treatment for the elimination of pain or restoration of normal activities or any chronic condition requiring treatment for preservation of life. It is recognized that there is considerable difficulty in arriving at a definition of emergency medical aid. It is intended by this definition to put a stop to practices in some townships of paying for surgical operations or medical treatments for disabilities of long standing and in which no emergency is indicated. For instance there are reports of hernia operations charged to the town-

ship, whereas the disability was known to have existed for a number of years previous to the individual becoming a public charge. Likewise there are reports of tonsillectomies, considerable treatment of persons whose ailment is largely a mental state and for whom medical aid does no good, etc. Such treatments as these should not be ordered by the relief agency. Likewise it is hoped by this definition to assure treatment for illnesses and surgical conditions that are plainly of an emergency character requiring such treatment to prevent permanent injury or loss of life.

3. It is recognized that the best results from the standpoint of the indigent will be obtained if he is permitted to use his customary physician. This should be made possible under any plan, except that extraordinary expense for travel should not be permitted if there is a physician within a given community qualified to give treatments. In general, this purpose should be sought.

4. The service is most likely to be satisfactory if the local relief agency completes an arrangement with the township or county medical association, by which the purpose given in paragraph No 3 can be attained.

5. The method of payment is usually the point of greatest difference. This has given rise to contracts with single or a few physicians within a community as well as to insufficient medical aid where relief authorities have objected to what they believed to be high costs. Two plans are suggested, as follows:

- a. Payment on a fee basis. It is reasonable to pay according to the actual service received. However, it is reasonable also to expect that physicians will be willing to accept a fee for poor relief services much lower than their customary fees. This is indicated not only because of the nature of the work itself, but also because the physician has only one debtor for this service and usually will be paid with reasonable promptness. It is suggested that fees to be charged shall not exceed fifty per cent of the average fees charged within a community but that a maximum scale be established which with possible exceptions, shall not exceed 50 cents for an office call and \$1.00 for home calls with other services in proportion. Exceptions may be arranged also for excessive travel necessary where there is no physician available within a community for needed service.

Any exception to this rule could take place only in those few larger communities of the state where regular office call and home call fees are much above the average. At the low fee of 50 cents an office call and \$1.00 a house call a physician must be expected to supply no drugs or medicines with the possible exception of inexpensive tablets or pills.

- b. Payment on a unit contract basis. In some communities it may be advisable not to use the fee basis and this is proposed as an alternative.

*Prepared by the Executive Committee of the Indiana State Medical Association and promulgated by William H. Boole, Director of the Governor's Commission on Unemployment Relief. This plan has been approved by the Relief Director at Washington.

In such communities, effort should be made to agree upon a reasonable total cost to the relief agency for all medical relief needed for the ensuing month. When that is done, individual payments would be made on a unit basis. If, for instance, an office call was agreed on as the base unit, the officials and physicians would then agree upon what number of units to assign for any other form of medical aid. Physicians would report the number of units of medical service given within the month. At the end of the month, the total number of units of service would be divided into the total appropriations for the month, to determine the amount to be paid for each unit of service in that month. Physicians would then be paid accordingly. If a physician had given 100 units of service, he would receive 100 times the per unit rate for that month. If such a plan is used, at the close of the month, when reports have been received and payment made, the relief agency should check the figures to ascertain just what amount has been paid per office call, per home call, etc., and if it finds these rates excessive or inadequate, the appropriation for the ensuing month should be gauged accordingly.

Arrangements upon unit contract basis shall be established only in communities specifically designated by the State Relief Commission.

The above suggestions are submitted for consideration of local relief agencies. The Governor's Commission, however, wishes to add some specific instructions which will apply to all counties receiving Federal aid. They are as follows:

1 Federal aid money cannot be used to pay hospital care or any other institutional care, or for medical aid to chronic cases of the character mentioned in Paragraph 2. There is no reason why hospital bills may not be paid out of local relief funds.

2 Federal aid money may be used to pay reasonable surgical fees but only for strictly emergency operations.

3 Federal aid money cannot be used in payment of medical aid wherever a relief agency contracts with a single physician or a small group of physicians unless the Governor's Commission has approved such arrangements.

4 In any Federal aid county using the unit contract basis of payment for medical aid, the amount of money proposed to be agreed upon as the total expenditure within any month, must be submitted to the State Relief Director before the beginning of such month. Accompanying this figure should be information for each of the preceding six months, showing number of persons given medical aid, number of office calls, number of home calls, total of miscellaneous services, and actual expenditures incurred.

It is suggested that if any relief agency is unable to reach an agreement with the local medical associations, a committee consisting of the

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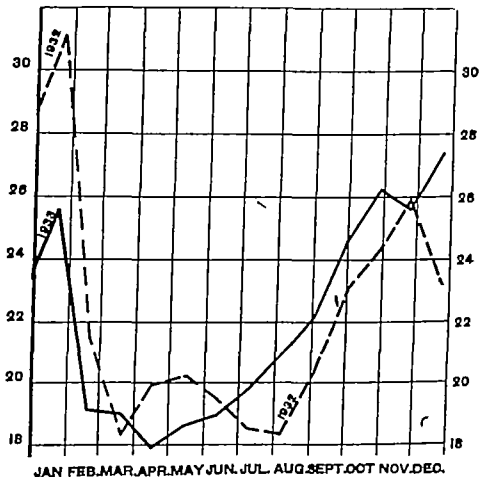
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These suggestions should be interpreted in the light of such a policy. Adequate medical aid at reasonable cost is the purpose of this statement.

The State Relief Office will be in a position to advise when necessary concerning reasonable charges for surgical service.

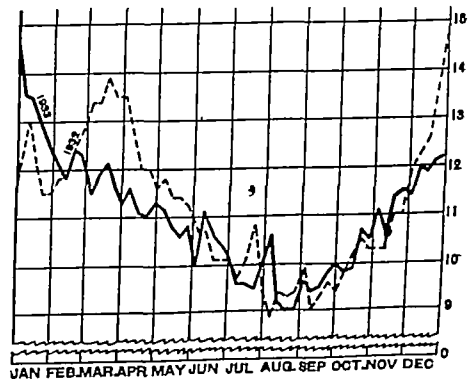
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MORTALITY RECORDS FOR 1932 AND 1933 AS
THE FIGURES FROM THE REPORTING CITIES
SHOW

DEATH RATE PER 100,000 PERSONS



Based on reports from 88 large cities

THE THOMAS W SALMON MEMORIAL COMMITTEE REPORT TO THE NEW YORK ACADEMY OF MEDICINE AND PRESENTATION OF PORTRAIT OF THE LATE DR. THOMAS W SALMON*

Mr President, Fellows and Members of the Academy

I appreciate the honor of having been requested by your President to appear upon the program of this Annual Meeting. In behalf of the Thomas W Salmon Memorial Committee of the Academy, I wish briefly to account for our stewardship.

In keeping with the obligations assumed by this Committee, as agent for the Academy, the fields of psychiatry and mental hygiene have been surveyed in this country and abroad and the names of twenty-seven leaders in psychiatry, neurology, mental hygiene, psychology and the social sciences have been before the Committee for more than a year as possible recipients of the Salmon Lectureship award. The recent and remote contributions of these scientists have been made a matter of record and, in the archives of the Committee, future accomplishments will be recorded.

It is a great pleasure to be able to advise the Fellows of the Academy of the unanimous selection of Dr C Macfie Campbell as the Thomas W Salmon Memorial Lecturer for the year 1934. Dr Campbell, Professor of Psychiatry at Harvard University since 1920, has been an active participant in all of the leading movements for the advancement of psychiatry. He was, for a number of years, President of the Massachusetts Mental Hygiene Society. He delivered the Shattuck Lecture in 1924 on "Psychiatry and the Practice of Medicine," the Gehrman Lectures in Hygiene at the University of Illinois, in 1932 on "The Schizophrenic Problem," and the Lowell Lectures in Boston in 1932 on "Human Personality and the Environment."

His experience in directing a hospital which deals with a wide variety of social problems associated with psychiatric conditions and his eminence in the psychiatric world are so well known that it is unnecessary to review in detail his many contributions.

The Salmon Memorial Lectures will be given here on April 13, 20 and 27, 1934.

Not only has the Committee been charged with the responsibility of selecting the Salmon Lecturer, but upon it has devolved the task of stimulating advance in psychiatry and associated fields within the resources at its command. To this end eighteen applications for financial assistance of research projects have been reviewed by the Committee. The large number of applications for aid necessitated the formulation of a policy which favors subsidizing research which can be made effective by a grant of a comparatively modest amount. The following projects were chosen for subsidies by the Committee.

*The major part of the report as delivered by the Chairman Dr C C Burlingame.

Miss Muriel T Bashlow, Judge Baker Foundation, for studies on psychometric results of clinical psychotherapy in cases of emotional blocking among juveniles.

Dr Clarence O Cheney, New York Psychiatric Institute for Endocrinological studies in psychiatric patients.

Dr Franklin G Ebaugh, Colorado Psychopathic Hospital, Denver, for studies on treatment of epilepsy with Emmenin (the name applied by Professor Collip of McGill University to a hormone he has isolated from human placentas).

Dr Norman Fenton, Bureau of Juvenile Research, California, for a study on the mental and social traits of 400 boys in a State Correctional School and the relationship of these traits to later behavior on placement.

Dr John Levy, New York, for an experimental study of therapeutic approaches to enuresis.

Dr Jacob Kasanin, Clinical Director, State Hospital for Mental Diseases, Howard, Rhode Island, for the purchase of an oscillogram for investigation of the peripheral circulation in schizophrenia.

Dr James L. McCartney, Director, Classification Clinic at Elmira, N Y for a classification of prisoners.

Dr Lloyd H Ziegler, Professor of Psychiatry and Neurology at Albany Medical School, for a study of psychopathic effects and their relation to the surface temperature of the body.

The Editorial Board of the Archives of Neurology and Psychiatry for the reprinting and distribution of certain articles dealing with the training of the neurologist and psychiatrist.

A further responsibility has been entrusted to me by the Committee, and one regarding which I have considerable sentiment. I am sure that each member of the Committee who was personally associated with Dr Salmon would have been pleased to have had this next duty entrusted to him, but through the generosity of the members, I have been selected to present to the Academy this portrait of Dr Salmon. To all of us he is not only one of the great leaders of psychiatry but one of the great men in medicine of our day. I have not altogether a cordial feeling about using the word memorial in connection with one whose leadership unquestionably continues. It suggests somewhat the termination of a man's life work. So it is that this portrait is presented to the Academy not as a part of a memorial to Dr Salmon, but as a symbol of a living movement.

Committee

GEORGE H. KIRBY, M.D.,

ADOLF MEYER, M.D.,

FREDERICK TILNEY, M.D.

WILLIAM L. RUSSELL, M.D.,

E. G. ZABISKIE, M.D.,

BERNARD SACHS, M.D.

C. C. BURLINGAME, M.D., *Chairman*

The Salmon Fund, comprising 596 subscriptions,

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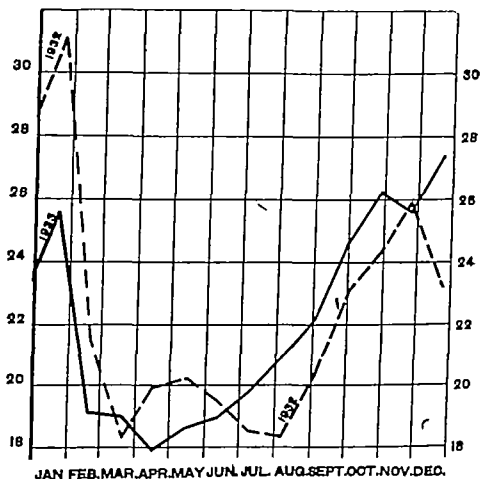
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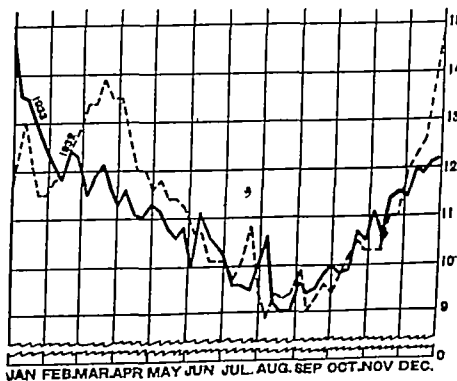
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February 2, 1934

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For these reasons I think that it would be wise to follow the Latin saying "Festina lente" (make haste slowly)

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Vitaminized yeast bread chocolate confectionery, cod liver oil milk, bananas and fruit—everything has been and is being irradiated and filled to overflowing with vitamins A, B, C, D, G, isolated and grouped and assembled in so many "units"

A wonderful example of what an idea will do—make the civilized and professional world wild with excitement, experimentation and commercial enthusiasm It is curious that an idea and a coined word may be capable of accomplishing so much A question or two well worthy of thought however, come to mind in this connection

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The major plans of the Memorial call for a series of lectures to be delivered each year. The Committee seriously assumed its task of annually surveying universities, medical schools and scientific societies in its weighing of the individual to be chosen to deliver the Salmon Memorial Lectures.

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RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JANUARY, 1934

Measles and whooping cough continue to be reported in unusually high numbers.

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Anterior poliomyelitis, chicken pox, epidemic cerebrospinal meningitis, German measles, scarlet fever, and tuberculosis other forms show nothing remarkable.

RARE DISEASES

Anterior poliomyelitis was reported from Boston, 1, Malden, 1, total, 2.

Anthrax was reported from Peabody, 1.

Dysentery (amebic) was reported from Sharon, 1, *dysentery (bacillary)* was reported from Boston, 1 total, 2.

Encephalitis lethargica was reported from Boston, 2, Foxboro, 1, Lowell, 1 Quincy, 3 total, 7.

Epidemic cerebrospinal meningitis was reported from Brookline, 1, Cambridge, 1, Quincy, 1, Salem, 1, Somerville, 1, West Bridgewater, 1 total, 6.

Malaria was reported from Brookline, 1, Cambridge, 1, Chelsea, 2, Northampton, 1, total, 5.

Septic sore throat was reported from Arlington, 1, Auburn, 1, Boston, 6, Danvers, 1 Fitchburg, 1,

Malden, 1; Northfield, 1, Springfield, 1, Watertown, 1, Weston, 1 Worcester, 1, total, 16.

Tetanus was reported from Dartmouth, 1, New Bedford, 1, total, 2.

Trachoma was reported from Boston, 1, Gloucester, 8, Malden, 1, New Bedford, 1, Woburn, 1, total, 12.

Trichinosis was reported from Lexington, 1.

Undulant fever was reported from Springfield, 1.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

MONTHLY REPORT FOR JANUARY, 1934

	Jan 1934	Jan. 1933	Average*
Anterior Poliomyelitis	2	1	5
Chicken Pox	1649	1715	1654
Diphtheria	74	134	354
Dog Bite	340	299	295
Epidemic Cerebrospinal Meningitis	6	9	11
German Measles	47	27	71
Gonorrhea	516	465	552
Lobar Pneumonia	710	919	804
Measles	6070	601	1708
Mumps	651	750	796
Scarlet Fever	1029	1659	1563
Syphilis	372	392	373
Tuberculosis Pulmonary	319	270	352
Tuberculosis Other Forms	47	31	42
Typhoid Fever	5	11	15
Undulant Fever	1	—	—
Whooping Cough	1759	739	962

*Average number of cases for January during the preceding five years.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

PRELIMINARY CANCER STATISTICS FOR 1933

CANCER CLINICS

(Slight changes may be made when figures are completed.)

	1933	1932
Attendance at clinics	3888	3427
Number with cancer	984	793
Number of cancers with probable cure	347	263
Median duration in months before coming to clinic		
Buccal	7.2	6.0
Breast	5.6	8.0
Uterus	6.8	6.3
Skin	18.4	24.2
Others	8.1	6.9
Total	8.5	10.4

PONDVILLE HOSPITAL

Patients admitted to Pondville	1203	1013
Patients discharged from Pondville		
Alive	964	751
Dead	256	253

CANCER DEATH RECORDS (January-October inclusive)

5392 5314

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Anthrax was reported from Peabody, 1.

Dysentery (amebic) was reported from Sharon, 1. *Dysentery (bacillary)* was reported from Boston, 1 total, 2.

Encephalitis lethargica was reported from Boston, 2, Foxboro, 1, Lowell, 1 Quincy, 3 total, 7.

Epidemic cerebrospinal meningitis was reported from Brookline, 1, Cambridge, 1 Quincy, 1, Salem, 1, Somerville, 1, West Bridgewater, 1, total, 6.

Malaria was reported from Brookline, 1, Cambridge, 1, Chelsea, 2, Northampton, 1, total, 5.

Septic sore throat was reported from Arlington, 1, Auburn, 1, Boston, 6, Danvers, 1, Fitchburg, 1,

Malden, 1, Northfield, 1, Springfield, 1, Watertown, 1, Weston, 1, Worcester, 1, total, 16.

Tetanus was reported from Dartmouth, 1, New Bedford, 1, total, 2.

Trachoma was reported from Boston, 1, Gloucester, 8, Malden, 1, New Bedford, 1, Woburn, 1, total, 12.

Trichinosis was reported from Lexington, 1.

Undulant fever was reported from Springfield, 1.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

MONTHLY REPORT FOR JANUARY, 1934

	Jan 1934	Jan. Ayr 1933	age*
Anterior Poliomyelitis	2	1	5
Chicken Pox	1649	1715	1654
Diphtheria	74	134	354
Dog Bite	340	299	295
Epidemic Cerebrospinal Meningitis	6	9	11
German Measles	47	27	71
Gonorrhea	516	465	552
Lobar Pneumonia	710	919	804
Measles	6070	601	1708
Mumps	651	750	796
Scarlet Fever	1029	1659	1563
Syphilis	372	392	373
Tuberculosis Pulmonary	319	270	352
Tuberculosis Other Forms	47	31	42
Typhoid Fever	5	11	15
Undulant Fever	1	—	—
Whooping Cough	1759	739	962

*Average number of cases for January during the preceding five years.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

PRELIMINARY CANCER STATISTICS FOR 1933

CANCER CLINICS

(Slight changes may be made when figures are completed.)

	1933	1932
Attendance at clinics	3888	3427
Number with cancer	984	793
Number of cancers with probable cure	347	263
Median duration in months before coming to clinic		
Buccal	72	60
Breast	56	80
Uterus	68	63
Skin	184	242
Others	81	69
Total	85	104

PONDVILLE HOSPITAL

Patients admitted to Pondville	1203	1013
Patients discharged from Pondville		
Alive	964	751
Dead	256	253

CANCER DEATH RECORDS (January-October inclusive)

5392 5314

CORRESPONDENCE

IS TOTAL THYROIDECTOMY AS A NEW METHOD
OF TREATMENT RATIONAL?

February 2, 1934

New England Journal of Medicine,

Physicians' attention has been called to the question whether total ablation of the thyroid would prove beneficial in cases of heart failure and angina pectoris without endangering the general condition of the patients

That an improvement might be the result of the operation was known long ago, as such cases were described by Kocher who performed a number of total thyroidectomies. Kocher's warning against total thyroidectomies was based on his experience that many patients developed myxedema and cretinism. At that time Kocher did not have at his disposal the thyroid hormone. The physician now is more fortunate in this respect. Still there arise some questions to which an authoritative answer would be of interest.

Dr. Blumgart's way of reasoning is this: Through a total thyroidectomy the metabolic rate becomes permanently low. The heart that cannot meet the demands of normal metabolism can become efficient in meeting lesser demands. The bad effects of total ablation can be corrected by giving the thyroid hormone.

This way of reasoning would be correct under two conditions. First, if it were proved that the only function of the thyroid is acceleration of the metabolism and, secondly, if it were proved that comfortable, useful, active life could be maintained at a permanently low metabolic rate.

So far as I know, neither has been proved. Myxedema and cretinism are little encouraging in this respect. The metabolism regulates all vegetative, animal and psychic functions of the human being, also the production of heat which is so essential for maintaining one's activities. Is it not reasonable to assume that a low metabolic rate must have a deleterious effect on the human being as a whole?

Recently I have read a paper in the 'Proceedings of the Mayo Clinic' which related a case of diabetes mellitus in a man of 26 treated by a total thyroidectomy to relieve diabetes. The authors do not encourage the repetition of such operations for diabetes. The patient 'complains that sensitiveness to cold and lack of endurance are so disturbing that the advantage of improved tolerance is not appreciated.'

Little is known about the interrelation between the glands of internal secretion. Elimination of the thyroid must change the functions of all these glands. Rogovitch showed that hypertrophy of the pituitary follows the extirpation of the thyroid in animals. Cohn described a case where symptoms similar to Graves' disease developed with an enlargement of the thyroid during normal menstruation. Is it not reasonable to presume that elimina-

tion of the thyroid would affect all functions dependent on the glands of internal secretion? Does one know much about it?

Only time and quite comparatively long time can show whether total ablation of the thyroid would be disastrous and whether bad consequences can be prevented by supplying an inadequate quantity of the hormone in order to keep the metabolism at a low rate. Of course, the supply of an adequate quantity of the hormone would make the operation purposeless.

George Gray Ward has said: "He who attempts to make Nature deviate from her normal physiologic processes may accomplish his immediate object but it is very apt to be at an exorbitant price."

For these reasons I think that it would be wise to follow the Latin saying "Festina lente" (make haste slowly).

Sincerely yours,

O. R. LOURIE, M.D.

IN RE VITAMINS

Editor, *New England Journal of Medicine,*

A few years ago, approximately 20, mankind had never heard about vitamins. About that time or to be more exact, in 1912, Casimir Funk in examining rice screenings found what he thought belonged to the amin group in chemistry and as this thing or these things seemed necessary to life (vita) he named it or them Vitamins. Since then the newly coined word has through different avenues become a household word. The commercial side of life saw its value very promptly and has utilized it rigorously.

Vitaminized yeast, bread, chocolate, confectionery, cod liver oil, milk, bananas and fruit,—everything has been and is being irradiated and filled to overflowing with vitamins A, B, C, D, G, isolated and grouped and assembled in so many "units."

A wonderful example of what an idea will do—make the civilized and professional world wild with excitement, experimentation and commercial enthusiasm. It is curious that an idea and a coined word may be capable of accomplishing so much. A question or two well worthy of thought however come to mind in this connection.

Who put vitamins so-called into foods?

When were they put into foods?

Did man do it?

For what purpose were they put into foods?

It is well known that they (so-called vitamins, thanks to Casimir Funk) were in food in just the right variety and quantity before man came onto the earth. Why should not man study nature a bit more searchingly and learn a lesson or two from her more or less easily read book? It might and probably would be profitable for humanity so to do!

It is safe to assume that whoever or whatever made vitamins to begin with and put them into food, evidently knew what they were for. And vitamins have quietly done their work since before man came, and certainly ages before man knew anything at all about them. It is only as a result of the recent

scientific spirit of inquiry and investigation that they, whatever they may eventually turn out to be, have attracted such wholesale attention

May there not be other things discovered in foods, some time, when man has grown up a little more and has other means of analysis at his command, more perfect than he has at present? A word of caution might reasonably be expressed to the effect that an excess of a natural endocrine, for instance, may do even fatal harm to an organism, just as certainly and definitely as too little will do injury, though of a different kind hyper and hypo-thyroidism form a good example of this action.

Still further questions can man *make* (create) vitamins? Quite as easily as he can create a grain of corn, or a rose, or apple, etc Does man know how much of any sort of vitamin nature intended man to have at any one time in his body?

There is still something for man to learn and in the meantime, while slowly learning, he had better use caution in liberal quantity with the vitamins he prescribes

Very truly yours,

JOHN P SUTHERLAND, M D

OBSTETRICAL ANALGESIA AT THE BOSTON LYING-IN HOSPITAL

Boston Lying In Hospital

221 Longwood Avenue, Boston, Massachusetts

February 5, 1934

The Editor,

New England Journal of Medicine,

I have read with much interest your editorial appearing in the February first number of the *New England Journal of Medicine*

There has been a considerable amount of work done on obstetrical analgesia at the Boston Lying In Hospital It has been our distinct impression that the use of drugs for producing hypnosis during childbirth should be confined to a hospital alone In the January, 1934 number of *Surgery, Gynecology and Obstetrics* appears an article entitled "The Barbiturates and Other Hypnotics in Labor," by Saul Berman, H. Bristol Nelson and me, in which this statement is made "No patient in labor who is given any hypnotic drug should ever be left even momentarily without constant, competent nursing supervision No such medication should be administered when labor is conducted in the patient's home It is an affair for a hospital alone and all relatives and friends must be excluded from the room. No patient at the completion of labor should be left alone until she is thoroughly awake and able to answer questions intelligently"

We believe it essential that these precautions be taken since it is quite possible for an unconscious patient to do herself an injury if left unattended In such a case, the responsibility of the attending physician might seriously be called in question.

Very truly yours,

F C IRVING, M D, *Visiting Obstetrician*

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

January 30, 1934.

535 North Dearborn St., Chicago, Ill

Managing Editor,

The New England Journal of Medicine,

In addition to the articles enumerated in our letter of January 4 the following have been accepted

Fairchild Bros & Foster

Soluble Stomach Extract (Fairchild)

Gilliland Laboratories, Inc.

Rabies Vaccine-Gilliland (Semple Method), 14 vial package

Hynson, Westcott & Dunning

Ampules Solution Antimony Thioglycollamide, 0.4 per cent, 10 cc

Ampules Solution Antimony Sodium Thioglycolate, 0.5 per cent, 10 cc.

Lederle Laboratories, Inc

Tablets Cod Liver Oil Concentrate (Lederle)

Elil Lilly & Co

Metycaine

Ampoules Metycaine 1%, 1 cc

Ampoules Metycaine 2% and Epinephrine (1 25,000), 1 cc.

Ampoules Metycaine 2% and Epinephrine (1 50,000), 25 cc.

Solution Metycaine 2%

Tablets Metycaine, 0.15 Gm

E S Miller Laboratories

Ampoule Sterile Solution Dextrose, U.S.P., 50 Gm, 100 cc.

Ampoule-Vial Sterile Solution Dextrose, U.S.P., 10 Gm, 20 cc

Ampoule-Vial Sterile Solution Dextrose, U.S.P., 25 Gm, 50 cc

Ampoule-Vial Sterile Solution Dextrose, U.S.P., 50 Gm, 100 cc

National Drug Company

Refined Diphtheria Toxoid (Alum Precipitated)

Parke, Davis & Co

Ventriculin, 500 Gm bottle

Soluble Gelatine Capsules Parke-Davis Haliver Oil, Plain, 3 minims

Schering & Glatz, Inc

Urotropin

Tablets Urotropin 5 Grains (0.33 Gm)

Tablets Urotropin 7½ Grains (0.5 Gm)

Euphthalmine Hydrochloride

E R Squibb & Sons

Refined Diphtheria Toxoid Alum Precipitated-Squibb

Ucoline Products Co

Ucoline Standardized Cod Liver Oil

Yours very truly,

PAUL NICHOLAS LEECH, *Secretary,*

Council on Pharmacy and Chemistry

RECENT DEATHS

SHAW—JOHN HOLBROOK SHAW, M.D., of 43 Court Street, Plymouth, Massachusetts, died at his home February 13, 1934. He was born September 15, 1865, in East Bridgewater, the son of Dr. John J. Shaw, and Persis R. (Kingman) Shaw.

His premedical education was acquired in the Plymouth schools, and Phillips Academy, Braintree. His M.D. degree was conferred by the Harvard Medical School in 1892. After graduation he took post graduate courses at the Boston University School of Medicine, and abroad. His practice was devoted to ophthalmology. For several years he served as physician to the public schools of Plymouth. He served in France during the World War, and was a member of post No. 40 of the American Legion.

He was affiliated with the Congregational Church, the Masonic Order, the Massachusetts Audubon Society, the Appalachian Club, the Natural History Society, the Plymouth Mens Glee Club, The Boys Club, the Red Cross and was a director of the Plymouth Public Library. Dr. Shaw is survived by a brother, J. Henry Shaw, of Plymouth.

WALSH—JEFFREY JAMES WALSH, M.D., of Providence, Rhode Island, died in Fall River, Massachusetts, February 14, 1934. He was born in Fall River in 1882. He graduated from the Tufts College Medical School in 1918. He was a member of the staffs of St. Joseph's and the Rhode Island State Hospitals in Providence. He is survived by his widow Mrs. Mary Margaret (Ward) Walsh.

OBITUARY

MEMORIAL ON THE DEATH OF DR. WILLIAM E. DENNING, WORCESTER*

Dr. William Edward Denning of Worcester died suddenly, while starting his car, on the evening of December 6, 1933. The cause of his death was coronary thrombosis. He is survived by his sisters, Mrs. Katherine Wood of Montreal, Canada, and Mrs. Mary Triebel of Burlington, Vermont, and by his nephews Harold and George Wood of Montreal and William J. Denning of 9 Brookline Street, Worcester, with whom he had made his home for many years.

Dr. Denning was born in Burlington, Vermont, May 18, 1872, the son of William and Caroline (Elliott) Denning. His early education was obtained in the schools of his native city and his medical education at the Medical School of the University of Vermont from which he received the degree of Doctor of Medicine in 1899. Following his graduation from medical school he came to Worcester as the first interne at St. Vincent's Hospital serving in that capacity during 1899 and 1900. Upon completing his internship he opened his office on Lincoln Street,

Worcester, and engaged in the general practice of medicine until 1908 when he went to Vienna to engage in postgraduate study at the General Hospital where he devoted special attention to gynecology and obstetrics under the tutelage of such distinguished masters as Tandler, Schauta and Wertheim. After a year at Vienna he went to London, contemplating only a short sightseeing visit. A chance meeting with Lane, the famous bone surgeon, resulted in a four months stay at Guy's Hospital, spent largely at Lane's Clinic.

In the busy years that followed, Dr. Denning remained always the student making frequent and unobtrusive visits to the foremost surgical and obstetrical clinics of this country.

His hospital connections were many and varied. From 1901 until his resignation in 1909 he served as Assistant Surgeon at St. Vincent's Hospital on the service of Dr. Homer Gage. He also served on the staff of The Memorial Hospital from 1903 until his resignation in 1921, officially as Assistant Dermatologist, but fully as often as Out Patient Surgeon and Gynecologist. The major work of his career began on the Obstetrical Service at the Worcester City Hospital in 1910 and ended only at his death. He served the hospital as Visiting Obstetrician and was for several years Chief of that Service. From 1911 until his retirement to the Consulting Staff at the age limit in 1932 he also served with distinction on the Surgical Service of the City Hospital. At the time of his retirement he was President of the Staff.

In addition to these duties he found time to serve as a Consultant at Fairlawn Hospital, Harrington Memorial Hospital, Southbridge, Webster District Hospital, Holden District Hospital and the Millers River Hospital, Winchendon. For several months after the war he was Examiner in Surgery for the United States Veterans' Bureau.

He was a Fellow of the American College of Surgeons, the New England Obstetrical and Gynecological Society, the American Medical Association, the Massachusetts Medical Society and the Worcester District Medical Society, which he served as President in 1929 and 1930. At the time of his death he was a Councillor from the Worcester District of the Massachusetts Medical Society. Besides memberships in these societies he was a member of the Military Order of the World War, the General Charles Devens Post of the American Legion, the Worcester Economic Club, the Worcester Club and the Worcester Country Club.

When the United States declared war against Germany in 1917 Dr. Denning applied for a commission in the Medical Reserve Corps of the United States Army and while awaiting its arrival examined many recruits for the Yankee Division and the newly formed draft boards. Commissioned a First Lieutenant in the Medical Corps in May, 1917, he was ordered to Fort Benjamin Harrison, Indiana. He was later transferred to Camp Zachary Taylor, Kentucky, whence early in 1918 he was ordered to

*Read to the Worcester District Medical Society at the Worcester City Hospital January 10, 1934.

France where he served for several months as a surgeon at Base Hospital No 113 and as Regimental Surgeon of the 33rd Engineers Regiment. He returned to the United States in July, 1919, having attained the rank of Captain. His war service touched him deeply and a needy, wounded or disabled veteran always found him a generous and sympathetic friend and a warm advocate.

In the midst of his busy life he found fair time for play and recreation. He enjoyed watching many sports especially football and running races. More over, he was a good bowler and played a dependable game of golf. Hunting and fishing were his favorite pastimes and often they happily drew him from the trammels of his professional life. He spent many pleasant hours at his "blind" at Lake Singletary when the distant honking of wild geese proclaimed their southward migration. Spring and the ice going out of the Maine lakes would find him heedless and inattentive and intimates knew that in fancy he had heard the far cry of a loon, the splash of trout or salmon and the hum of a spinning reel on cold, blue waters. Then, one morning, he was gone—'up to the big timber'."

All this was Denning, the physician and the man. The deftness of hand, the sureness of eye, the keenness of intuition that was his made him a truly great surgeon long to be mourned by his associates and his patients. His tremendous experience, his amazing knowledge and his gift of simple explanation made him a splendid teacher. While, to his subordinates he may have seemed a hard taskmaster he exacted even more of himself. He had the rare gift of organization as few men possess it and once the plan was clear in his mind he fought it through at all costs.

And yet, withal, he was kind, generous and tender. What charities fell from his hands, the world will never know. Even with his intimates he brooked no reference to them. Vainly in life did he seek to hide from the world the warm glow of his kindly heart. Now that his firm lips can no longer protest our scrutiny, Death has drawn aside the veil and disclosed for all to see not only the great physician, the loyal friend, the noble citizen but behind it all that mystical indefinable something that is a man. "Eternal rest grant to him, O Lord, and may perpetual life shine upon him."

Signed

DONALD S. ADAMS, M.D.
BENJAMIN F. ANDREWS, M.D.
JOSEPH W. O'CONNOR, M.D.

NOTICES

RADIO HEALTH MESSAGES

FEBRUARY-MARCH, 1934

Sponsorship: Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.
Courtesy WBZ. Fridays 4:30 P.M.

February

23 Lumps in the Neck

March

2 Age and Cancer

9 Some Problems of Epilepsy

16 Fractures

23 How to Keep the Well Child Well

30 Résumé of the Year's Work

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Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

SPECIAL

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Sponsored by the Massachusetts Department of Public Health. Assisted by Miss Violette Babcock, Violinist, and Mr. G. Lambert Roscoe, Pianist and Organist.

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Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health, Blended with Classical Music.

After you have heard this program, we would appreciate your comments.

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The clinical meeting of the Staff of the Massachusetts General Hospital was held in the Moseley Memorial Building, on Thursday, January 11, 1934, at 8:15 P.M., with Dr. Robbins presiding. The program consisted of the "X-ray Diagnosis of Esophageal Varices," by Dr. Richard Schatzki, "The Clinical Significance of Bleeding from the Upper Intestinal Tract," by Dr. Chester M. Jones, "Massive Hemorrhage from Duodenal Ulcer, Surgical Treatment," by Dr. Arthur W. Allen, "Gastroscopy," by Dr. Edward B. Benedict and "Encephalitis in St. Louis" by Dr. Leake of the U. S. Public Health Department.

Esophageal varicose veins according to Dr Schatzki, the first speaker of the evening, are characteristic of portal obstruction, commonly as in Cirrhosis of the Liver and Thrombosis of the Splenic Vein. However, the clinical diagnosis of these varices is oftentimes not easy, and one can only hazard a guess that unexplained hemorrhage from the upper intestinal tract is due to them. There are morphological signs however that are pathognomonic of the condition, namely, the x-ray visualization of the varices themselves. The diagnosis by this method can be made more often than has been done in the past and Schatzki himself has demonstrated forty-five cases in the last two and a half years twenty-eight of which were later confirmed at autopsy.

The principle involved depends on the production of a thin coating of barium over the inner surface of the esophagus yielding a cast of the inside wall of this organ. Complete filling shows nothing of the varices but by the above-mentioned technique one can demonstrate the filling defects formed by the varices. These are represented in the films as tortuous bands of differing densities as well as by an absolute irregularity of the line of contour. Dr Schatzki warns one not to depend on profile pictures for diagnosis, but to visualize an isolated enlarged vessel extending over a large portion of the esophagus.

Regarding the localization of the dilated veins, the speaker has found this to vary. Thus they may extend over the whole of the thoracic portion of the organ sometimes they stop immediately at the diaphragm occasionally they even involve the stomach. The diagnosis may be easy in cases of extensive varices, but may be very difficult in cases in which these are rather small and limited. In the latter instances, the picture is confusingly similar to that obtained with carcinoma. Differences can be elicited however that aid in the differentiation. In the first place the esophagus in the presence of extensive varices still maintains its normal degree of elasticity this is not true of one infiltrated with cancer. In the second place varices can be pressed out during peristalsis whereas cancerous growths cannot be. Finally the size of the varices can be changed by varying the inner thoracic pressure. To this end the patient is to inspire deeply and close the glottis whereupon the operator applies pressure to the chest. Such a maneuver produces no effect in carcinoma.

The x-ray visualization of esophageal varices has according to Dr Schatzki the following practical values: (1) It makes possible early definite diagnosis of cirrhosis of the liver when this is difficult or impossible on a clinical basis. (2) When found in conjunction with a tumor in the left upper quadrant it indicates that the latter is an enlarged spleen the result of cirrhosis of the liver or thrombosis of the splenic vein. (3) It prevents needless exploration in cases of bleeding from the upper intestinal tract, as the place of bleeding is definitely localized by the x-ray. (4) It has prognostic value for example Dr Schatzki had several cases in whom there were no

previous histories of hemorrhage, but who developed fatal hemorrhages, in short periods following, after the diagnosis had thus been established.

Dr Chester M. Jones the next speaker, considered in a very practical manner the way to handle a case with bleeding from the upper intestinal tract. He stated that the significance of such bleeding implies first, a consideration of diagnosis and secondly a consideration of treatment.

The cases may be classified from two points of view namely, from the standpoint of type of bleeding or from the standpoint of the presence or absence of emergency. Thus under the first method of classification the type of bleeding, one may find either frank hematemesis or the passage of the blood by stool. In the former, there is vomiting of bright red blood or of coffee-ground material. In the latter there is no vomiting and in exceptional cases the stool contains apparently fresh blood of a red or dark red color depending on the rate with which the material passes through the gastro-intestinal tract. According to the second method of classification the presence or absence of emergency, one places in a group those cases with a history of recent bleeding but without any present state of emergency in other those in which there is a massive acute hemorrhage with resultant shock.

In the shock cases accurate precise diagnosis is, frequently, impossible. Here the problem is that of immediate treatment of the acute hemorrhage. A correct diagnosis may be established later. In the non-emergency cases on the contrary one can afford to wait with treatment, in the meantime carrying out the correct procedures for the establishment of a diagnosis. The first group presents the typical picture of shock with pallor, cold moist sweaty skin, rapid regular but thready pulse, rapid shallow respiration, anxiety and restlessness, low blood pressure and a certain degree of elevation of the temperature. The second or non-emergency group complains of weakness and dyspnea on exertion from these usually a fairly good history can be obtained. According to Dr Jones most mistakes in the diagnosis and treatment of these bleeding cases arise from failure to consider the conditions that can cause hemorrhage. Moreover as each case has its own peculiar individuality it warrants an original consideration. He abhors any routine procedure as utterly inadequate.

There are three prominent conditions that the speaker listed as causing bleeding from the upper gastro-intestinal tract. These are as follows: (1) Peptic ulcer either gastric or duodenal. (2) Carcinoma of the stomach. (3) Esophageal varices. A fourth might also be included namely acute gastritis.

In general either in acute or chronic bleeding one can get a story giving some clue to the diagnosis. Hence a good history is requisite for rapid treatment. There may be cases in which the diagnosis can not be made from the history, as in shock. However in these the knowledge of past ulcers or operation for ulcer may be extremely helpful. A very short story of gastro-intestinal symptoms in a non-alcoholic

France where he served for several months as a surgeon at Base Hospital No 113 and as Regimental Surgeon of the 33rd Engineers Regiment. He returned to the United States in July, 1919, having attained the rank of Captain. His war service touched him deeply and a needy, wounded or disabled veteran always found him a generous and sympathetic friend and a warm advocate.

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The clinical meeting of the Staff of the Massachusetts General Hospital was held in the Moseley Memorial Building, on Thursday, January 11, 1934, at 8:15 P.M., with Dr. Robbins presiding. The program consisted of the "X-ray Diagnosis of Esophageal Varices," by Dr. Richard Schatzki; "The Clinical Significance of Bleeding from the Upper Intestinal Tract," by Dr. Chester M. Jones; "Massive Hemorrhage from Duodenal Ulcer, Surgical Treatment," by Dr. Arthur W. Allen; "Gastroscopy," by Dr. Edward B. Benedict; and "Encephalitis in St. Louis," by Dr. Leake of the U.S. Public Health Department.

Esophageal varicose veins, according to Dr Schatzki, the first speaker of the evening are characteristic of portal obstruction commonly as in Cirrhosis of the Liver and Thrombosis of the Splenic Vein. However, the clinical diagnosis of these varices is oftentimes not easy and one can only hazard a guess that unexplained hemorrhage from the upper intestinal tract is due to them. There are morphological signs however, that are pathognomonic of the condition, namely the x-ray visualization of the varices themselves. The diagnosis by this method can be made more often than has been done in the past and Schatzki himself has demonstrated forty-five cases in the last two and a half years twenty-eight of which were later confirmed at autopsy.

The principle involved depends on the production of a thin coating of barium over the inner surface of the esophagus yielding a cast of the inside wall of this organ. Complete filling shows nothing of the varices but by the above-mentioned technique one can demonstrate the filling defects formed by the varices. These are represented in the films as tortuous bands of differing densities as well as by an absolute irregularity of the line of contour. Dr Schatzki warns one not to depend on profile pictures for diagnosis, but to visualize an isolated enlarged vessel extending over a large portion of the esophagus.

Regarding the localization of the dilated veins the speaker has found this to vary. Thus they may extend over the whole of the thoracic portion of the organ; sometimes they stop immediately at the diaphragm; occasionally they even involve the stomach. The diagnosis may be easy in cases of extensive varices, but may be very difficult in cases in which these are rather small and limited. In the latter instances the picture is confusingly similar to that obtained with carcinoma. Differences can be elicited however, that aid in the differentiation. In the first place the esophagus in the presence of extensive varices still maintains its normal degree of elasticity; this is not true of one infiltrated with cancer. In the second place varices can be pressed out during peristalsis whereas cancerous growths cannot be. Finally the size of the varices can be changed by varying the inner thoracic pressure. To this end the patient is to inspire deeply and close the glottis whereupon the operator applies pressure to the chest. Such a maneuver produces no effect in carcinoma.

The x-ray visualization of esophageal varices has according to Dr Schatzki the following practical values: (1) It makes possible early definite diagnosis of cirrhosis of the liver when this is difficult or impossible on a clinical basis. (2) When found in conjunction with a tumor in the left upper quadrant it indicates that the latter is an enlarged spleen the result of cirrhosis of the liver or thrombosis of the splenic vein. (3) It prevents needless exploration in cases of bleeding from the upper intestinal tract, as the place of bleeding is definitely localized by the x-ray. (4) It has prognostic value. For example Dr Schatzki had several cases in whom there were no

previous histories of hemorrhage but who developed fatal hemorrhages, in short periods following, after the diagnosis had thus been established.

Dr Chester M. Jones, the next speaker, considered in a very practical manner the way to handle a case with bleeding from the upper intestinal tract. He stated that the significance of such bleeding implies first, a consideration of diagnosis and secondly, a consideration of treatment.

The cases may be classified from two points of view namely, from the standpoint of type of bleeding or from the standpoint of the presence or absence of emergency. Thus under the first method of classification the type of bleeding one may find either frank hematemesis or the passage of the blood by stool. In the former, there is vomiting of bright red blood or of coffee-ground material. In the latter, there is no vomiting and in exceptional cases the stool contains apparently fresh blood of a red or dark red color depending on the rate with which the material passes through the gastro-intestinal tract. According to the second method of classification the presence or absence of emergency, one places in a group those cases with a history of recent bleeding but without any present state of emergency. In another, those in which there is a massive acute hemorrhage with resultant shock.

In the shock cases accurate precise diagnosis is, frequently impossible. Here the problem is that of immediate treatment of the acute hemorrhage. A correct diagnosis may be established later. In the non-emergency cases on the contrary one can afford to wait with treatment, in the meantime carrying out the correct procedures for the establishment of a diagnosis. The first group presents the typical picture of shock with pallor, cold moist sweaty skin, rapid regular but thready pulse, rapid shallow respiration, anxiety and restlessness, low blood pressure and a certain degree of elevation of the temperature. The second or non-emergency group complains of weakness and dyspnea on exertion. From these usually a fairly good history can be obtained. According to Dr Jones most mistakes in the diagnosis and treatment of these bleeding cases arise from failure to consider the conditions that can cause hemorrhage. Moreover as each case has its own peculiar individuality it warrants an original consideration. He abhors any routine procedure as utterly inadequate.

There are three prominent conditions that the speaker listed as causing bleeding from the upper gastro-intestinal tract. These are as follows: (1) Peptic ulcer, either gastric or duodenal. (2) Carcinoma of the stomach. (3) Esophageal varices. A fourth might also be included namely acute gastritis.

In general, either in acute or chronic bleeding one can get a story giving some clue to the diagnosis. Hence a good history is requisite for rapid treatment. There may be cases in which the diagnosis cannot be made from the history as in shock. However in these the knowledge of past ulcers or operation for ulcer may be extremely helpful. A very short story of gastro-intestinal symptoms in a non-alcoholic

individual leads one to suspect carcinoma. Massive hemorrhage from a cancer of the stomach is not the usual finding, however, the bleeding is more generally prolonged, more so than in ulcer, and seldom results in a single acute outburst. Moreover, if one can find a mass or if there is noticeable emaciation, he can then with more certainty lean toward the diagnosis of malignancy or cirrhosis of the liver. If, on the contrary, the patient is a very heavy drinker, one should consider the possibility of cirrhosis of the liver and acute or chronic gastritis. Either of the latter can cause massive hemorrhage. The finding of an enlarged liver or spleen by palpation or percussion, the presence of small telangiectases on the face or trunk, and evidence of collateral circulation, establish the diagnosis of cirrhosis of the liver.

The diagnosis of gastritis without x-ray and in the absence of an alcoholic history, according to Dr. Jones, was very difficult. The other causes of massive hemorrhage, which he briefly characterized were leiomyoma of the stomach, diaphragmatic hernia, polyps in the stomach, esophageal lesions, a group of blood diseases, purpura hemorrhagica, leukemia, hemophilia, polycythemia vera, lymphoma of the stomach, duodenum, esophagus, acute yellow atrophy, jaundice from any cause, cancer of the head of the pancreas, severe diabetic acidosis, and mechanical and chemical irritants. Diaphragmatic hernia occurs in short, overweight individuals, with short necks and esophagi, may cause anemia, and is characterized by nocturnal symptoms. X-ray diagnosis here, is absolutely necessary. Polyposis of the stomach may result in an acute hemorrhage with a blood picture exactly like pernicious anemia.

What should be the attitude of the medical man to patients showing upper gastro-intestinal tract bleeding? Dr. Jones believes that in the non-emergency cases, treatment should be withheld until an accurate diagnosis has been established. This can generally be made on the basis of a careful and detailed history, and on equally extensive x-ray studies. In these patients the physical examination may be negative. Gastric analysis may be resorted to but Dr. Jones does not believe it to be of much aid. However, if achlorhydria after histamine is brought out in the analysis then one may expect the bleeding to be from a malignancy rather than from an ulcer. Stool examination, too, may furnish a clue. Thus positive guaiac tests obtained for more than two or three weeks would tend to point to malignancy, as bleeding from an ulcer is not usually so prolonged. The location of gastric lesions is significant. Not all of them are malignant, of course, but all prepyloric lesions ought to be considered so.

With regard to the bleeding ulcer case, there are the following considerations: 1. In the younger individual in whom the hemorrhage is an initial affair treatment calls for detailed and persistent medical measures. In the individual with a history of several hemorrhages surgery ought seriously to be advocated, preferably of the radical sort, not only the ulcer but a goodly portion of the stomach needs to be re-

moved. In the older individual with recurring hemorrhage from a duodenal ulcer surgically treated, the procedure varies according to the nature of the case. Hence, those cases that have gone on without proper and adequate care following operation can be tried on more medical treatment, those, however, that have bled in spite of good care require more surgery.

According to Dr. Jones, in the cases with esophageal varices that are not demonstrable by x-ray, it is still true that the prognosis is surprising and much better than we have a right to expect. Alcoholic patients with gastritis should be treated by withdrawal of alcohol and the institution of an ulcer régime. Rest is of the utmost importance in these cases, as well as the maintenance of regular eating habits. Care must be taken to prevent deficiency diseases. Purpura, leukemia, hemophilia, and polycythemia have their own treatments. Esophageal lesions, malignancies and ulcers, are as a rule unsatisfactory to treat, surgery may be recommended for those situated in the upper and lower portions of the esophagus. In hemorrhage from jaundice, one resorts to transfusions and glucose intravenously. There is nothing to be done for the patient bleeding from a carcinoma of the pancreas. For bleeding diabetic patients, one immediately washes out the stomach and then proceeds with the regular diabetic treatment.

In the cases with shock resulting from an acute, massive hemorrhage, the problem is one of expeditious treatment. To this end, Dr. Jones stresses the necessity for the surgeon and the medical man to work hand in hand. The most probable cause for such hemorrhage is ulcer. Transfusion in the presence of a falling blood pressure and a rising pulse in a young person is not contraindicated. It should be delayed, if possible, however, till the patient has passed the crisis. Obtain donors and use them as the need arises. Fluids should be given by rectum or by hypodermoclysis, and not by vein. If by rectum, morphine should also be used to prevent peristalsis. The most important consideration, he repeats, is the absolute coöperation of the medical man and the surgeon.

Dr. Arthur W. Allen, in his discussion of the surgical treatment of massive hemorrhage from duodenal ulcer, brought out some interesting facts, based on a study of two thousand cases. He found that one-third of the cases had a story of massive hemorrhage that 60 per cent of these died in their first attack of bleeding, though they bled on an average of sixteen days before they died. They never have one enormous hemorrhage and then die. Most of the cases that looked bad after a single hemorrhage usually got well. The fatal cases showed an ulcer on the posterior duodenal wall, invariably eroding a large vessel.

Regarding treatment, patients under fifty, in whom mortality is only 4.4 per cent should be placed on a medical régime. Those fifty to seventy years of age, in whom mortality is 33 per cent, can be helped by properly worked-out surgery. Patients in the acute

stage should be hospitalized and carefully watched. If their blood pressure falls below seventy, they should be given slow small transfusions. Providing this is bled out, a massive transfusion on the operating table is indicated, during a bold attempt to ligate the bleeding vessel. The stomach is transected in its lower one-third and lifted up. The ulcer is widely exposed, a finger placed on it and the ulcer cut away.

Dr Edward B. Benedict demonstrated a flexible gastroscope. This instrument he feels is a very valuable adjunct to the x-ray in the diagnosis of gastritis. Its introduction into the stomach is no more difficult than is that of an ordinary large stomach tube. The patient requires no general anesthesia, just cocaineizing of the throat.

Dr Leake of the U. S. Public Health Department gave an interesting account of the epidemic of encephalitis in St. Louis illustrating his talk with instructive lantern slides.

THE COMMUNITY HEALTH ASSOCIATION

An increase in the number of free nursing visits made to the homes of the sick in Boston last year, or 20,000 more free visits than were made in 1929, was reported by Miss Florence M. Patterson, general director of the Community Health Association at the annual meeting held February 14. Malcolm Donald, Esq. was re-elected president for the tenth consecutive year and Dr. George H. Bigelow, former State Commissioner of Public Health, was elected chairman of the medical advisory committee and a member of the board of managers.

Other officers elected for the year 1934 were Miss Gertrude W. Peabody of Cambridge and Mrs. Gardiner H. Fiske of Boston vice presidents, Mrs. Frederick S. Dellenbaugh Jr., Chestnut Hill secretary and Richard C. Paine, Brookline Treasurer.

A total of 42,599 patients or one out of every nineteen persons in Boston were given home care by the Community Health nurses and 265,891 visits were made last year. Nearly half of these visits were made to patients who could not afford to pay anything for the service.

Miss Patterson also reported an increase in the number of cases of grippe, measles and infantile paralysis to whom the nurses gave care. With the exception of 1927 there were more children with infantile paralysis given home treatment than there have been for fifteen years. More expectant mothers than ever before came to the fourteen mothers' classes which are held every week in as many districts of Boston for instruction in the care of themselves and their babies. Attendance at these classes totaled 12,502.

SUFFOLK DISTRICT MEDICAL SOCIETY

The joint meeting of the Suffolk District Medical Society, the Trudeau Society and the Boston Medical Library was held at the Boston Medical Library January 31, 1934, with Dr. James Howard Means

presiding. Dr. Willard Soper of the William Wirth Winchester Hospital, West Haven, Connecticut, was the guest speaker of the evening. His topic was "The Present View of Collapse Therapy in Pulmonary Tuberculosis."

He stated that this form of treatment began in Europe in 1912, and about 1914 it was started in Boston whence it spread throughout the rest of the United States.

Its action on the pulmonary lymphatics or circulation is not yet settled, but it is certain that tension is relieved and the lung rested by this form of therapy. However, it is to be used as an adjunct and not to replace other lung therapy.

The following methods are in use at the present time:

I. Artificial Pneumothorax

1. Unilateral.
2. Bilateral.
3. Contralateral.
4. Associated with artificial pneumothorax.
 - (a) Pneumolysis, internal and external.
 - (b) Oleothorax.

II. Phrenic Nerve Operations

1. Simple Cutting
2. Evulsion (Exeresis)
3. Crushing
4. Alcoholization.

III. Thoracoplasty

1. Total.
2. Partial.

IV. Apicolysis

1. Fat or Muscle
2. Bag
3. Paraffin. (Plombage)

V. Combinations of Procedures

During the period from January 1, 1929 to January 1, 1934, 59 per cent of admissions at the William Wirth Winchester Hospital were treated by some form of collapse therapy.

It has been stated that pulmonary cavities of greater than 5 cm. lead to death in five years without collapse and that a persistently positive sputum gave a poor prognosis. Accordingly the object of collapse therapy is to close the cavities and eliminate tubercle bacilli from the sputum.

The indications for unilateral pneumothorax are extensive unilateral fibrocaceous or plastic tuberculosis with or without positive sputa, obstinate hemoptysis and acute tuberculous pneumonia. The speaker said that the ordinarily considered contraindications such as enteritis, kidney disease, or laryngitis are not valid in most part unless the complication is extremely severe. The obstacle of adhesions is met in about 20-25 per cent of the cases but much depends upon whether they prevent collapse. Pathology in the other lung is not necessarily a contraindication to this therapy though it may be said to be the chief cause of failure. Air embolus and pleural shock have been rare in his experience. Pathology on the contralateral side frequently

clears up following the procedure. In those cases in which unilateral pneumothorax was effective and maintained from one to three years after the bacilli disappeared from the sputum and the cavity closed, three times as many were alive in two to fifteen years as those who were not given pneumothorax. Reexpanded lungs keep surprisingly well, and after two to eighteen years 76 per cent are leading normal lives.

Bilateral pneumothorax was done on those cases in which the disease was bilateral from the beginning and in those in whom a spread was seen in the lung not collapsed at first. Selective collapse of the lobes is desirable. Pathological lung lobes tend to contract more than normal lungs and selective collapse becomes more pronounced since more negative pressure is necessary to expand them than is the case with normal lobes. However, the danger of complications is more than doubled in bilateral procedures.

Contralateral collapse is used to take advantage of the resultant mediastinal shift and thus produce rest in the diseased side of the chest.

Pneumolysis serves as an aid to pneumothorax, the adhesions being destroyed by cauterization.

Oleothorax acts as a blockage to prevent early reexpansion after pneumothorax. A mixture of paraffin and olive oil is injected into the pleural cavity and may be removed later.

The indications for phrenic nerve operations are much the same as for unilateral artificial pneumothorax when the latter has proved unsuccessful. There are accessory phrenic nerve branches in one-half of the people. Evulsion of the nerve overcomes the tendency to temporary paralysis of the diaphragm. The operations facilitate the closure of cavities and the contraction of scars in the lung. They are effective with pathology in any part of the lung. The complications are few, such as gastric upsets, pain in the shoulder and arm, and dyspnea. They are usually transitory. Too much has been expected of the phrenic nerve operations. As an adjunct to bed rest they are excellent. Phrenic nerve crushing produces a temporary paralysis of the diaphragm on the side of the procedure. It is well to cut the accessory branches and crush the main trunk of the nerve. The average duration of the paralysis in such cases is six months.

Thoracoplasty is not applicable to the pneumonic type of pulmonary tuberculosis but it is to be used where the process is fibrous and contraction has taken place. The circulation must be good and the heart not embarrassed. Satisfactory results may be expected in 50 per cent or more of the cases. Partial thoracoplasty is often followed by the complete operation.

Apicolysis is indicated when apical adhesions prevent successful artificial pneumothorax. Cavities greater than 4 cm are not closed well by the use of paraffin.

Combinations of the various types of collapse

therapy have brought some very startling and satisfactory results. The procedures vary considerably with the individual cases and the speaker showed many roentgenological examples of such.

It has been found that fluid develops in 50 per cent of the cases treated by collapse therapy.

In closing Dr Soper said that we must remember that tuberculosis is a general infection and pulmonary surgery thus has its limits and that we should not forget that collapse therapy does not work a cure but is an adjuvant to bed rest, and in so far as we forget this fact we shall be disappointed in our results.

NEW ENGLAND PEDIATRIC SOCIETY

The next meeting of the New England Pediatric Society will be held in Boston, Friday, March 23, 1934. Program of the meeting will appear in this *Journal* shortly.

GERALD HOFFEL, M D, *Secretary*

THE NEISSERIAN MEDICAL SOCIETY OF MASSACHUSETTS

The ninth meeting of The Neisserian Medical Society of Massachusetts will be held on Wednesday evening, February 23, 1934, at 8 15 o'clock, in the auditorium of the Boston Dispensary.

Subject "The Clinical Diagnosis of Gonorrhea." (Conclusions based on a questionnaire.)

All interested persons are cordially invited.

OSCAR F COX, JR, M.D., *Secretary*

STATE HOSPITAL FOR MENTAL DISEASES, HOWARD, R I

Dr Lauretta Bender of the Psychopathic Division of Bellevue Hospital, New York, will speak on "Alcoholic Encephalopathy," Monday, February 26, 1934, at 8 15 P.M.

JACOB KASANIN, M D, *Clinical Director*

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

POSTPONEMENT OF MEETING

The meeting previously scheduled for February 20 at 5 P.M. at the Metropolitan State Hospital, Waltham, has been postponed to 5 P.M. February 28. The program for the meeting is as follows:

Speakers

Dr Roy D Halloran — "The Metropolitan State Hospital—Purpose and Development."

Dr Malcolm J Farrell — "Demonstration of Two Similar Psychotic Entities, Postencephalitis Lethargica and Dementia Praecox, Catatonic Type."

Dr Philip F Hilton—"Demonstration of Injection

Treatment of Varicose Veins in a Mental Hospital Population'

Dr Clifford D Moore—"Mental Disease Occurring in the Course of Physical Disease, with Particular Reference to Pulmonary Tuberculosis'

Buffet luncheon after the meeting

ALEXANDER A LEVI, M.D., Secretary

FAULKNER HOSPITAL CLINICAL MEETINGS

The next meeting will be held at the Faulkner Hospital at 5 00 P.M. on Thursday, March 1st In addition to the usual clinical pathological conference on the cases which have come to autopsy during the month Dr Burton E Hamilton will give a short talk on 'Recent Advances in the Clinical Use of the Electrocardiogram "

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening February 27, at 8 15 o'clock.

PROGRAM

Presentation of Cases

"Reminiscences' By Dr George B Magrath

JOHN HOMANS M.D. Secretary

BOSTON CITY HOSPITAL

STAFF CLINICAL MEETING

Tuesday, February 27 1934 at 8 00 P.M

Cheever Amphitheatre

1. Surgical Aspects of Acute Pancreatitis with Reports of 60 Cases from Boston City Hospital Drs Francis F Henderson and Elmer S. A. King
2. The Effect of Ligation of the Hepatic Artery Dr Stephen J Maddock
3. End Results in Carcinoma of the Stomach Dr Charles C Lund
4. The Influence of Anesthesia on the Pulmonary Circulation Time Drs Charles A. Lamb, John Shaw, and Brandt F Steele
5. Obstruction of the Colon by Gall Stones Review of the Literature and Case Report. Drs Irving J Walker and Henry F Howe
6. Congenital Arterial Venous Fistulae Dr E Everett O'Neil
7. Plasma Lipids as an Aid in the Interpretation of Jaundice Dr Earl R Lehnher

COMMITTEE ON HOSPITAL CLINICS

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

- February 23—Massachusetts Psychiatric Society will meet at the Boston Psychopathic Hospital at 8 P.M.
- February 26—New England Heart Association will meet in the Amphitheatre of the Children's Hospital at 8 15 P.M.
- February 26—State Hospital for Mental Diseases Howard R. I See page 452
- February 27—Boston City Hospital Staff Clinical Meeting See notice above

February 27—Harvard Medical Society See notice elsewhere on this page

February 28—The Neisserian Medical Society of Massachusetts See page 452

March 1—Faulkner Hospital Clinical Meeting See notice elsewhere on this page

March 5 6 and 7—The Southeastern Surgical Congress will be held at Nashville Tenn. For information write Dr B T Beasley 1019 Doctors Building Atlanta

March 9—William Harvey Society at Beth Israel Hospital. Speaker Dr Irving J Walker, Clinical Professor of Surgery, Harvard Medical School. Subject Judgment and Conscience in Surgery

March 12—House Officers Association Boston City Hospital, 8 P.M. Speakers Drs A Warren Stearns Abraham Myerson Subject Forensic Psychiatry

March 23—New England Pediatric Society See page 452

April 13, 20 and 27—Salmon Memorial Lectures See page 443

April 16—Boston University School of Medicine to Conduct a Clinical Meeting at Boston City Hospital

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E R Loveland, Executive Secretary 133-135 South 36th Street, Philadelphia Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C. Guy Lane, 416 Marlboro Street, Boston for details

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnlz General Secretary Dr H. E Walther Gloriastrasse 14 Zurich

September 3 6—American Public Health Association at Pasadena, California Dr J D Dunshee Chairman Local Committee on Arrangements

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association 450 Seventh Avenue New York, N Y

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday March 7—Lynn Hospital Clinic 5 P.M. Dinner 7 P.M. Speaker Dr Frank H Lahey Boston Subject to be announced Film Electrocardiogram.

Wednesday, April 4—Essex Sanatorium Middleton Clinic 5 P.M. Dinner 7 P.M. Speakers Dr Elliott P Joslin and Dr Howard F Root, Boston. Subject 'Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting at Salem Hospital, 3 30 P.M.

Tuesday May 8—Annual Meeting Salem Country Club Forrest Street, Peabody Dinner at 7 Speaker to be announced Subject to be announced.

RALPH E STONE M.D. Secretary

221 Cabot Street, Beverly Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield at 11 A.M.

CHARLES MOLINE M.D. Secretary

Sunderland Mass

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place in March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D. Secretary

76 Church Street, Winchester Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T. A. STAMAS M.D. Secretary

226 Central Street, Lowell, Mass

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

February 28—Note change of date See page 452

NORFOLK DISTRICT MEDICAL SOCIETY

February 27—Hotel Kenmore 8 30 P.M. Dr J H. Shortell Industrial Medicine and Surgery

March 27—Faulkner Hospital 8 30 P.M. Dr Henry H. Faxon and Dr Edward A. Edwards Symposium on 'Varicose Veins Discussion by Dr E. E O'Neil.

April 17—Hotel Kenmore 8 30 P.M. Special Business Meeting

May—Annual Meeting Time place and program to be announced.

FRANK S CRICKSHANK, M.D. Secretary

1695 Beacon Street, Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker Dr. Elliott P. Joslin. Subject: Diabetes.

May 3—12 noon at Norfolk County Hospital. Annual Meeting. Election of Officers.

N. R. PILLSBURY, M.D., Secretary
Norfolk County Hospital, South Braintree, Mass.

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals.

April 25—Annual Meeting at the Boston Medical Library. Election of Officers. Scientific Program, titles and speakers to be announced.

The Medical Profession is cordially invited to attend all of these meetings.

JAMES H. MEANS, M.D., Vice-President.
GEORGE P. REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass.

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows:

March 14—Dinner and scientific program at the Memorial Hospital, Worcester, Mass.

April 11—Open date.

May 9—Annual Meeting. Time and place to be announced later.

ERWIN C. MILLER, M.D., Secretary
27 Elm Street, Worcester, Mass.

BOOK REVIEWS

Maternal Mortality in New York City. A Study of All Puerperal Deaths 1930-1932, by the New York Academy of Medicine Committee on Public Health Relations. Ransom S. Hooker, Director of the Study. Published by The Commonwealth Fund. 290 Pages. Price \$2.00.

Extreme interest attaches to the recently published study of puerperal deaths in New York City during the three years, 1930-1932 inclusive, by the New York Academy of Medicine, Committee on Public Health Relations. Dr. Ransom S. Hooker, F.A.C.S., was the director of this research which was undertaken to determine by carefully collected and studied statistics the correctness of the frequent statement that the maternal mortality rate in the United States is unnecessarily high. Every maternal death during this period was investigated within one week of its occurrence and each case was studied by personal interviews with all the individuals concerned, attending physicians or midwives, hospital staff and family. On the basis of facts so gathered, each case was reviewed by a jury of experts and a diagnosis of preventable or not preventable was rendered in each instance. When the verdict was preventable it was further analyzed to determine whose was the responsibility. This procedure not only indicated how many of the maternal deaths reviewed were preventable but also the sources of failure, their relative magnitude, and the remedial efforts indicated.

Of the 2041 maternal deaths studied during the three-year period, the Committee finds that two thirds were preventable. Of the preventable cases approximately two-thirds were attributable to faulty medical judgment and lack of skill, and poor hos-

pital administration or incompetent midwifery. The remaining third of the preventable cases were considered due to the fact that prospective mothers had not been educated to seek proper medical care or did not cooperate with their physicians.

Each page of this report, which is a model of statistical clinical research, deserves thoughtful study by physicians, especially obstetricians and general practitioners. A point to which we would direct particular attention is that with regard to anesthesia and operative delivery. The Committee finds "that the use of anesthesia during labor and delivery has grown steadily in extent since its introduction in the last century, and is a problem of the most pressing importance, more so in the United States than in any other country. This has come about to a large extent through pressure from the lay public. The women of the large urban centers have become steadily more insistent in their demands for shorter and less painful parturition, and the accoucheur may disregard these demands only at great risk to his own practice. The wide effects of the increased use of anesthesia can only be guessed at, but the direct effect of the administration of the anesthetic in its tendency to lessen and enfeeble the expulsive powers of the uterine musculature must be reflected in an increased necessity for artificial assistance at delivery. The frequent use of instrumentation is based upon the accessibility of anesthesia. It is the opinion of many observers that the increase in the use of anesthesia is a factor in keeping the maternal mortality rate stationary."

The Committee further finds that 'a prominent feature of the development of modern obstetrical practice has been a steady increase in the proportion of operative deliveries. According to authoritative estimates, not more than 5 per cent of all delivery cases require operative intervention. A study of the records of 67 hospitals in which almost 75 per cent of all hospital deliveries occur, shows that operative intervention is practiced in 24.3 per cent. In the city as a whole it is estimated that 1 out of every 5 deliveries is an operative delivery.' In comparing the maternal deaths in operative deliveries and those in which the delivery was spontaneous the Committee found that the maternal mortality was five times as high among the operative deliveries as among the spontaneous ones.

In commenting on this finding, the Committee states that 'the increase in the use of instrumentation brings with it an increased hazard is evident if the relative rates for spontaneous and operative delivery are examined. We cannot disregard the enormous difference between them. The death rate for spontaneous deliveries is less than one-fifth that for the operative. Clearly this represents a serious defect in the management of these cases. It is not contended that the rates can be made equal; the necessity for operative intervention arises, at times, out of serious abnormalities or disturbances of the

mechanism of labor, which, in themselves, greatly increase the hazards. But any such disparity as that shown in these figures is a certain indictment of those undertaking the interference. The Committee believes that a reduction of the mortality rate can be achieved through a reduction in operative intervention. Increasing demand on the part of the patient for shorter and less painful parturition, the greatly increased use of anesthesia, the spread of the knowledge of surgical techniques and the pressure of time upon the attendant, the Committee believes, is responsible for the increase in operative deliveries.

Some practitioners who have foreseen and foretold the effects of the too-free use of obstetrical anesthesia and who have held to a minimum the amount of their operative intervention have not only been professionally criticized, but have suffered in their practice from the unreasoning popular demand for anesthesia and operative intervention. Perhaps this report may suggest that they have not in every instance been wholly in the wrong. It should also be remembered that needless anesthesia, and its corollary needless operative intervention are probably also responsible for a considerable percentage of the preventable infant mortality at or shortly after birth.

The Physicians' Art An Attempt to Expand John Locke's Fragment *De Arte Medica* By ALEXANDER GEORGE GIBSON Oxford At the Clarendon Press—1930 237 Pages Price \$3 00

The subtitle of this book 'An Attempt to Expand John Locke's Fragment *De Arte Medica*' will be read with surprise by many physicians, for though Locke is claimed by the medical profession his Fragment has attracted too little attention. The manuscript bears the date 1669, and as in the following year his famous "Essay Concerning the Humane Understanding" was planned, we may think of him as distracted from completing the earlier project. The empirical character of his philosophy of the mind is consonant with the tendencies of the physician and although Locke's medical practice seems not to have been extensive his penetrating mind has laid bare some of the principles of the healing art, so that the Fragment makes one wish that he might have written an Essay on the Philosophy of Medicine. The bent of his mind however practical by nature must have received great stimulus in his association with Sydenham 'The British Hippocrates', and it would be interesting to trace the influence of that vigorous personality on the younger physician.

Gibson's attempt is not quite in accord with the subtitle for he says "The chapters that follow the fragment are devoted to what appears to the author to be the fundamentals of the medical art in no sense are they an expansion of Locke's thoughts except that they start from the same conception that Locke puts forward. Locke says 'Yet I think I may confidently affirm that those hypothesis well

tied the long & elaborate discourses of the ancients & suffered not their enquiries to extend themselves any farther than how the phenomena of diseases might be explained by these doctrines & the rules of practice accommodated to the received principles has at best confined & narrowed men's thoughts, amused their understandings with fine but useless speculations & diverted their enquiries from the true & advantageous knowledge of things'. It was to the study of things and away from the study of words that Francis Bacon attempted to turn the minds of men. In spite of its fragmentary nature what Locke has said on the medical art is worth reading and re-reading.

The "expansions" by the author naturally suffer by comparison with Locke. The dangers of his undertaking the author acknowledges. "His (the author's) thoughts are the outcome of a serious and prolonged study from many points of view and are based on the reflections noted down in the daily course of practice. There is evidence of the mature and thoughtful mind with the insight that comes only from experience but the book is too much a collection of maxims to be enjoyed in continuous reading. It is a book of substance good for the older physician as a reminder of some of the best traditions in medicine, and particularly to be recommended to the younger physician as it points out some of the beauties of the science and especially of the art which he has just begun to enjoy. As befits the traditions of John Locke the substance is eminently practical and sound. Another sentence from Locke may be quoted "all speculations on this subject however curious or refined or seeming profound & solid if they teach not their followers to do something either better or in a shorter & easier way than otherwise they could or else lead them to the discovery of some new & useful invention deserve not the name of knowledge'.

Modern Aspects of Gastro-Enterology By M. A. ARAFA. Published by William Wood & Company, Baltimore 374 Pages Price \$8 25

Primarily a textbook for the general practitioner who will find here an adequate description of the more common gastro-intestinal diseases. For the internist or the gastro-enterologist it offers little that is new or valuable because it attempts to cover too large a field. Its chief value for the practitioner lies not so much in the discussion of the clinical signs and symptoms of enterologic pathology but in the description and value of relatively simple laboratory procedures which are so frequently neglected and which may be of vast importance. It contains much valuable information on such subjects as the gastric analysis and particularly stool analyses, a much neglected procedure. The chapters on procto-sigmoidoscopy and the differential diagnosis of colonic ulcerations may be read with profit by anyone. The author's views on the etiology of pathologic

processes such as peptic ulcer, and ulcerative colitis, which are still controversial, are quite conservative, an attempt being made to present all views rather fairly, the reader being allowed to draw his own conclusions from the evidence presented

Mystery, Magic, and Medicine By HOWARD W HAGGARD Published by Doubleday, Doran & Company, Inc. 192 Pages Price \$1.00

This small monograph describing the rise of scientific medicine from its beginning in mystery and superstition through a progress encountered by ignorance and quackery to the status of an exact science appears as a sequel to the author's earlier and larger work, "Devils, Drugs, and Doctors," reviewed some years ago in the columns of this Journal. Like its predecessor, the present volume is abundantly illustrated with many excellent and interesting woodcuts, chiefly portraits of notable figures in the history of medical progress. It is presented as a single, continuous story told from the pre-Hippocratic days of Aesculapius to the present time. The volume concludes with an admirable alphabetical glossary of proper names and medical terms which should prove particularly convenient to the casual reader or student, for whom the book furnishes a compendious brief sketch of the history of medicine.

La Cellulite By L. ALQUIER. Published by Masson et Cie. 285 Pages Price 30 fr

In "La Cellulite" Alquier discusses abnormal variations in the flow of blood and lymph which take place in the tissues during a great variety of pathological conditions. His approach to this subject is made in such a metaphysical manner that it is almost impossible to submit it to a critical review. Throughout the book the author speaks in the vaguest terms of the "vago-sympathetic" system and its control over the flow of lymph and tissue fluid. He postulates that infection and contraction of lymphatic channels along the vessels set up vasomotor reflexes over the perivascular sympathetic plexuses. These 'vago-sympathetic' reflexes, he claims, are capable of modifying the flow of lymph to a part in much the same way that the vasoconstrictor and vasodilator nerves regulate the flow of blood. In the entire volume there is not a single photomicrograph to back up these novel pathological concepts, nor any measurements in experimental animals to prove an abnormal flow or change in composition of the lymph. To anyone who has read recent reviews of homeostasis or lymphatic physiology, there is not a recognizable landmark in this book. Yet Alquier attributes to disordered regulation of the flow of lymph every conceivable condition from causalgia and angina pectoris to constipation.

From the viewpoint of therapy, the author believes that all these conditions can be relieved by restoring the normal vago-sympathetic tone and a healthy flow

of lymph through the occluded perivascular channels. This, he states, is an easy matter through the use of "massage, vago-sympathetic gymnastics, actino-thermo-phototherapy, and surgico-electrical reflexotherapy." The book surpasses any volume on quackery I have ever read!

Urine and Urinalysis By LOUIS GERSHENFELD Published by Lea & Febiger, Philadelphia Price \$2.75

This book is not intended to be an exhaustive treatise on urinalysis. It is short and the contents are well organized. While there is very little new presented in urinalysis, the various tests are described sufficiently in detail and evaluated. This book of 272 pages should be helpful for quick reference, and is a text worth while having on the office desk and in the laboratory.

BOOKS RECEIVED FOR REVIEW

Maternal Mortality in New York City A Study of All Puerperal Deaths 1930-1932. By the New York Academy of Medicine Committee on Public Health Relations. Ransom S. Hooker, Director of the Study. Published by The Commonwealth Fund. 290 Pages Price \$2.00

Post Operative Treatment by George S. Foster. Published by The Christopher Publishing House, Boston. 323 Pages Price \$5.00

The Surgical Clinics of North America Volume 13, Number 5. October, 1933. Chicago. Number Published by W. B. Saunders Company. Issued serially, one number every other month. Octavo of 254 pages with 93 illustrations. Per clinic year, February, 1933, to December, 1933. Price, paper, \$12.00 cloth, \$16.00 net.

Hygiene of the Mind by Baron Ernst von Feuchtersleben. Translated from the German by F. C. Sumner. Published by The Macmillan Company. 150 Pages Price \$1.25

Chronic Nasal Sinusitis and Its Relation to General Medicine by Patrick Watson Williams. Second Edition. Published by John Wright & Sons, Ltd. 263 Pages Price 15/- net

International Clinics Edited by Louis Hamman. Volume IV. Forty-Third Series, 1933. Published by J. B. Lippincott Company. 317 Pages

Diet and Personality—Fitting Food to Type and Environment By L. Jean Bogert. Published by The Macmillan Company. 223 Pages Price \$2.00

Red Medicine Socialized Health in Soviet Russia by Sir Arthur Newsholme and John A. Kingsbury. Published by Doubleday, Doran & Company, Inc. 324 Pages Price \$2.50

de Venarum Ostiolis 1603 of Hieronymus Fabricius of Aquapendente, (1533-1619) by K. J. Franklin, D.M. Published by Charles C. Thomas. 98 Pages Price \$3.00

Mystery, Magic, and Medicine by Howard W. Haggard. Published by Doubleday, Doran & Company, Inc. 192 Pages Price \$1.00

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CANCER OF THE PROSTATE AND PROSTATIC DISEASES

BY FREDERICK L. HOFFMAN, LL.D.⁶

THE general statistics of deaths from cancer of the prostate and prostatic diseases appear to have received quite inadequate consideration. Most of the references are very fragmentary and often derived from more or less untrustworthy sources. Yet it would seem to me that the urgency of such a study or review of the available facts would long since have been called for on account of the apparent increase in the mortality from this type of cancer regardless of the possibility that the increase may be more apparent than real, due to important age changes in the population and improvement in diagnostic procedure. It therefore occurred to me to re-examine the facts of the situation and the results of my preliminary study are presented as follows.

By way of introduction I quote a recent statement on "The Prostate and Seminal Vesicles from the Treatise on Human Cancer" by Dr. Arthur P. Stout, Associate Professor of Surgery, Columbia University, published in Philadelphia, 1932:

"Cancer of the prostate gland although it is the commonest site for cancer among the male genital organs according to von Berens and von Wolff (1924) is one of the less frequent causes of death from cancer in general. In the group studied by us there was an hospital incidence of 1.83 per cent (34 cases among 1862 cancers seen in ten years). It is remarkable because it is a disease of old age, the average age at onset lies between sixty and seventy years (it was sixty-five years in our group) because it is rarely cured and because it is very often preceded by hypertrophy of the prostate. Since hypertrophy of the prostate is generally accompanied by epithelial hyperplasia and is probably due to some irritational processes associated with involution, the cycle which we believe is associated with the initiation of all cancers is suggested here. As in all other parts of the body chronic irritation and epithelial hyperplasia are followed by cancer formation only in a relatively small number of instances. Renaud (1925) has shown that the death rate for cancer of the prostate is increasing, a phenomenon which may be explained on the basis that this is distinctly a disease of old men and that the proportionate number of old men to the general population has been steadily increasing. Prostatic cancers are also remarkable because of the frequency with which they metastasize and especially because of the

frequency with which the metastases lodge in bones. Bone metastases are observed in about 25 per cent of clinical cases and have been reported in as high as 70 per cent of autopsies."

I cannot agree that the situation regarding cancer of the prostate is one of less importance than that of many other forms of cancer receiving much more extended consideration. Using the data for 1929 for the United States registration area, I give the following comparative statistics: deaths from cancer of the rectum, 5,018; prostate, 4,359; bladder, 3,586; buccal cavity, 3,538; skin, 2,904; pancreas, 2,802; lungs and pleura, 2,304. The foregoing comparison may well arrest attention as visualizing with approximate accuracy the relative position of cancer of the prostate among kindred groups of malignant affections, nearly all of which apparently are receiving much more consideration on the part of research workers and the profession generally.

I give first a table showing deaths from cancer of the prostate in the United States registration area as compiled by the Census Office, 1920-1931, representing 38,486 deaths. In this table I also give the rates per 100,000 of male population.

MORTALITY FROM CANCER OF THE PROSTATE,
U. S. REG. AREA, 1920-1931

Rate per 100,000 of Male Population

Deaths	Rate	Deaths	Rate	Deaths	Rate
1920	1,597 3.6	1924	2,558 5.0	1928	4,145 7.3
1921	1,672 3.6	1925	3,068 5.9	1929	4,359 7.5
1922	2,022 4.2	1926	3,427 6.4	1930	4,648 7.7
1923	2,282 4.6	1927	3,784 6.8	1931	4,924 8.0

As shown by the preceding table, deaths from cancer of the prostate have increased from a rate of 3.6 per 100,000 male population in 1920 to 8.0 in 1931. In other words, the death rate has more than doubled during the intervening period of years. How far this is the result of age changes and improved methods of diagnosis and treatment, of course, is a debatable question. But as regards the age question, I am of the opinion that the effect has been of small importance during the period under review. As to diagnostic procedure and treatment, considerable progress has been made and that of course may have been effective in raising the number of deaths to a measurable degree. At the same time it seems to me that it goes without saying

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that there has been an actual increase in deaths from cancer of the prostate which cannot be explained away

I give next a table of deaths from cancer of the prostate in England and Wales for the period 1921-1930, later statistics not yet being available. In this table I have also included deaths and rates for Scotland for the same period of years

MORTALITY FROM CANCER OF THE PROSTATE—1921-1930

Rate per 100,000 Male Population

	England and Wales		Scotland	
	Deaths	Rate	Deaths	Rate
1921	756	4.18	70	2.98
1922	840	4.62	70	2.98
1923	975	5.33	101	4.31
1924	1,022	5.55	121	5.17
1925	1,116	6.03	136	5.81
1926	1,145	6.15	119	5.09
1927	1,172	6.26	115	4.93
1928	1,353	7.18	165	7.07
1929	1,430	7.55	149	6.39
1930	1,434	7.53	174	7.47

The two tables may be summarized in the statement that at the present time the death rate from cancer of the prostate is 8.0 per 100,000 male population for the United States Registration Area and 7.5 for England and Wales and 7.5 for Scotland, a remarkable conformity to practically an identical experience. I regret that I cannot give corresponding rates for other countries at this time but I have the matter under consideration and will communicate important data later.

Deaths from cancer of the prostate are not given according to age for this country, but I have compiled the data for England and Wales for the period 1921-1930 showing the actual deaths for the two five-year periods and the percentage distribution for each period likewise.

MORTALITY FROM CANCER OF THE PROSTATE IN ENGLAND AND WALES—1921-1930

Age	1921-1925		1926-1930	
	Deaths	Per Cent	Deaths	Per Cent
Under 35	12	0.25	10	0.15
35-39	8	0.17	13	0.20
40-44	20	0.42	17	0.26
45-49	66	1.40	60	0.91
50-54	181	3.84	210	3.21
55-59	386	8.20	459	7.02
60-64	714	15.16	990	15.15
65-69	1,044	22.17	1,400	21.43
70-74	1,063	22.57	1,595	24.41
75-79	785	16.67	1,124	17.20
80-84	314	6.67	472	7.22
85 and over	116	2.46	184	2.82
Total	4,709	100.00	6,534	100.00

It is shown by this table that cancer of the prostate may appear as early as at ages under 35, there having been 22 deaths during the ten years under review. At ages 35-39 there were 21 deaths, at 40-44, 37, and at 45-49, 126. After this the deaths rapidly increase until a maxi-

mum figure is reached at the age period 70-74. This table sustains the conclusion that the age change in the population has not been of sufficient significance to explain the actual increase from 4,709 deaths during the five years 1921-1925 to 6,534 in 1926-1930.

To eliminate the age factor entirely I add some statistics of cancer mortality for certain organs and parts on a standardized basis for England and Wales for years 1901-1930. I have selected for the present purpose, cancer of the tongue, esophagus, liver, lung, pancreas and bladder.

CANCER MORTALITY, ENGLAND AND WALES, 1901-1930

Rate per 100,000

	Tongue	Esophagus	Liver	Lung	Pancreas	Prostate
1901-1910	4.31	5.12	—	1.02	1.45	11.8
1911-1920	5.08	6.06	8.71	1.27	1.67	26.5
1921-1930	4.61	6.42	6.10	2.52	2.63	47.7

This is an exceedingly instructive comparison clearly showing the numerical importance, as well as the relative importance, of cancer of the prostate and kindred cancer affections.

According to a tabulation of cancer of the prostate ascertained in connection with my San Francisco Cancer Survey, based on 683 deaths in different localities of the United States and Canada, I find that the average age at death was 68.2 years, the lowest average age being reported for the New Orleans colored population, or 58.2 years, but the number of deaths is very small. So far as it is possible to judge, cancer of the prostate is much less common among the colored population than among the white but that of course may be due to failure of diagnosis.

For the purpose of comparison I give the average age at death for kindred cancer affections, having reference, of course, to the male population only. Cancer of the buccal cavity 60.6 years, esophagus 62.4, skin 63.7, rectum 60.8, tongue 59.6, prostate 68.2, bladder 64.2, larynx 60.4, lung 53.0 and pancreas 59.3.

I am also able to give some information concerning the known duration of the disease for cancer of the prostate ascertained in connection with my San Francisco Cancer Survey for a number of localities throughout this country and Canada. For all forms of cancer the average known duration of the disease was 15.4 months, for cancer of the prostate 19.7 months, tongue 14.7 months, esophagus 10.4 months, rectum 17.6 months, bladder 18.9 months, larynx 14.3 months, lung 11.0 months and pancreas 9.5 months. For the time being I am only giving the facts as I have found them without reflecting on their relative importance.

A discussion of cancer of the prostate cannot very well ignore some observations on deaths from diseases of the prostate. These may or may not have been potentially precancerous or

actually so without the facts being ascertained at autopsy, or by means of competent pathological examination. In the table below I give the deaths from diseases of the prostate in the United States Registration Area and the rates per 100,000 of male population.

MORTALITY FROM DISEASES OF THE PROSTATE,
U S REG AREA, 1920-1931

Rate per 100,000 Male Population

Deaths	Rate	Deaths	Rate	Deaths	Rate
1920	3 669 8 2	1924	4 842 9 5	1928	6 264 11 0
1921	3 804 8 2	1925	5 200 9 9	1929	6 407 11 0
1922	4 117 8 6	1926	5 600 10 4	1930	6 464 10 8
1923	4 540 9 2	1927	5 761 10 4	1931	6 541 10 6

According to this tabulation the death rate from diseases of the prostate in the United States registration area has increased from 8.2 per 100,000 male population in 1920 to 11.0 during 1928 and 1929, decreasing to a rate of 10.6 in 1931. It is thus shown that while both cancer of the prostate and diseases of the prostate have increased during recent years the latter affection is relatively more common than the former.

I give the corresponding figures for England and Wales 1921-1931 showing an increase in the rate of frequency from 11.8 per 100,000 in 1921 to 21.1 in 1931. The English rate therefore is just about double the American rate, a fact to which I have never seen any attention called before. In other words while cancer of the prostate prevails to about the same extent in this country and in England and Wales, diseases of the prostate are twice as common in the latter country as in the former.

MORTALITY FROM DISEASES OF THE PROSTATE,
ENGLAND AND WALES 1921-1931

Rate per 100,000 Male Population

Deaths	Rate	Deaths	Rate	Deaths	Rate
1921	2 124 11.8	1925	2 665 14.3	1929	3 760 19.8
1922	2 121 11.6	1926	2 705 14.5	1930	3 803 19.9
1923	2 288 12.5	1927	3 172 16.9	1931	4 039 21.1
1924	2 479 13.4	1928	3 407 18.0		

Without reflecting in detail upon the foregoing statistics I feel that they should make a useful contribution toward a better understanding of the numerical aspects of the cancer problem. However, to make this comparison as complete as possible I may add the statement that in Scotland in 1931 there were 157 deaths from cancer of the prostate compared with 364 deaths from diseases of the prostate. Deaths from diseases of the prostate in Scotland have increased from 256 in 1921 to 364 in 1931. In Holland there was an extraordinary increase from 318 deaths from diseases of the prostate in 1924 to 600 in 1929. The rate shows a persistent increase in Holland from 1911 onwards, the change having been as follows: 1911-1915 6.6 per 100,000, 1916-1920 8.2, 1921-1923 8.6, 1924-1928 12.2, 1929, 15.5. In Australia the rate increased from 8.2 per 100,000 male population in 1919 to a maximum of 12.0 in 1927,

while the actual deaths increased from 234 in 1918 to 319 in 1923, 380 in 1927, 394 in 1929, 418 in 1930 and 446 in 1931. In the Dominion of Canada in 1932 the number of deaths from cancer of the prostate was 377 while the number of deaths from diseases of the prostate during the same year was 878. Deaths from disease of the prostate in Canada increased from 638 in 1927 to 878 in 1932.

Thus the increase in diseases of the prostate seems to be world wide and well deserving of international studies comprehending all the principal countries. Unfortunately at the present time I am unable to contribute much additional information to this interesting situation.

Before concluding this discussion it seems appropriate to add a few observations upon recent contributions to the study of carcinoma of the prostate. Among the earlier papers is that of H. C. Bumpus, contributed to *Surgery, Gynecology and Obstetrics*, 1926, mentioned as being A Clinical Study of 1000 Cases of an average of 65 years. The average duration of the disease from the first symptom to death in 485 cases with no treatment was 31 months. With metastases two-thirds of the patients died under nine months from the time of examination. When no metastases were found after careful examination, the average duration of life was 1 year, although isolated cases lived considerably longer, e.g., four lived over three years, and two over ten. In 243 cases metastatic spread was demonstrable. In 44 per cent it had affected the lymphatics. As a result of completed records of 164 cases, the author concluded that surgery was unsatisfactory when the disease had advanced sufficiently to be positively diagnosed.

In the Ewing Memorial Volume, New York, 1931, is an important contribution on Carcinoma of the Prostate by Dr. Benjamin S. Barringer of New York who introduces his subject with the statement that

Carcinoma of the prostate still holds its place as the most baffling of urological conditions. We know little of its etiology. In but a small percentage of cases is the diagnosis made sufficiently early to give any sort of treatment a fair chance of success. Even if an early diagnosis be made there is no general agreement as to the best way to treat this neoplasm. We hold that the possibilities of radical surgery have been thoroughly exploited while the effective use of radiation is still far from the practical limits of its application to this disease.

In a series of 280 cases the earliest age period was under 34 with one patient, and the oldest 85 to 89, also with one patient. Most of the cases occurred at ages 50 to 79.

Among the initial symptoms in the 280 cases are frequency of micturition occurring in 47.8 per cent of the cases, difficulty in 34.2 per cent, nocturia in 28.8 per cent, dysuria in 21.4 per

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1921	3 804 8.2	1925	5 200 9.9	1929	6,407 11.0
1922	4 117 8.6	1926	5,600 10.4	1930	6 464 10.8
1923	4,540 9.2	1927	5,761 10.4	1931	6,541 10.6

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MORTALITY FROM DISEASES OF THE PROSTATE
ENGLAND AND WALES, 1921-1931

Rate per 100,000 Male Population

Deaths	Rate	Deaths	Rate	Deaths	Rate
1921	2 124 11.8	1925	2 665 14.3	1929	3,760 19.8
1922	2,121 11.6	1926	2,705 14.5	1930	3,803 19.9
1923	2 288 12.5	1927	3 172 16.9	1931	4,039 21.1
1924	2,479 13.4	1928	3,407 18.0		

Without reflecting in detail upon the foregoing statistics I feel that they should make a useful contribution toward a better understanding of the numerical aspects of the cancer problem. However, to make this comparison as complete as possible I may add the statement that in Scotland in 1931 there were 157 deaths from cancer of the prostate compared with 364 deaths from diseases of the prostate. Deaths from diseases of the prostate in Scotland have increased from 256 in 1921 to 364 in 1931. In Holland there was an extraordinary increase from 318 deaths from diseases of the prostate in 1924 to 600 in 1929. The rate shows a persistent increase in Holland from 1911 onwards, the change having been as follows: 1911-1915 6.6 per 100,000, 1916-1920 8.2, 1921-1923 8.6, 1924-1928 12.2, 1929, 15.5. In Australia the rate increased from 8.2 per 100,000 male population in 1919 to a maximum of 12.0 in 1927,

while the actual deaths increased from 234 in 1918 to 319 in 1923, 380 in 1927, 394 in 1929, 418 in 1930 and 446 in 1931. In the Dominion of Canada in 1932 the number of deaths from cancer of the prostate was 377 while the number of deaths from diseases of the prostate during the same year was 878. Deaths from disease of the prostate in Canada increased from 638 in 1927 to 878 in 1932.

Thus the increase in diseases of the prostate seems to be world wide and well deserving of international studies comprehending all the principal countries. Unfortunately at the present time I am unable to contribute much additional information to this interesting situation.

Before concluding this discussion it seems appropriate to add a few observations upon recent contributions to the study of carcinoma of the prostate. Among the earlier papers is that of H. C. Bumpus, contributed to *Surgery, Gynecology and Obstetrics*, 1926, mentioned as being A Clinical Study of 1000 Cases of an average of 65 years. The average duration of the disease from the first symptom to death in 485 cases with no treatment was 31 months. With metastases two-thirds of the patients died under nine months from the time of examination. When no metastases were found after careful examination, the average duration of life was 1 year, although isolated cases lived considerably longer, e.g., four lived over three years, and two over ten. In 243 cases metastatic spread was demonstrable. In 44 per cent it had affected the lymphatics. As a result of completed records of 164 cases, the author concluded that surgery was unsatisfactory when the disease had advanced sufficiently to be positively diagnosed.

In the Ewing Memorial Volume, New York, 1931, is an important contribution on Carcinoma of the Prostate by Dr. Benjamin S. Baringer of New York who introduces his subject with the statement that

'Carcinoma of the prostate still holds its place as the most baffling of urological conditions. We know little of its etiology. In but a small percentage of cases is the diagnosis made sufficiently early to give any sort of treatment a fair chance of success. Even if an early diagnosis be made there is no general agreement as to the best way to treat this neoplasm. We hold that the possibilities of radical surgery have been thoroughly exploited while the effective use of radiation is still far from the practical limits of its application to this disease.'

In a series of 280 cases the earliest age period was under 34 with one patient, and the oldest 85 to 89, also with one patient. Most of the cases occurred at ages 50 to 79.

Among the initial symptoms in the 280 cases are frequency of micturition occurring in 47.8 per cent of the cases, difficulty in 34.2 per cent, nocturia in 28.8 per cent, dysuria in 21.4 per

cent, retention in 167 per cent Constipation was met with in only 35 per cent of the cases and loss of weight in 28 per cent

Among the secondary symptoms occurring in the 280 cases are nocturia in 182 per cent, retention in 160 per cent, hematuria in 139 per cent, frequency in 121 per cent, dysuria in 114 per cent Constipation was recorded in 46 per cent The conclusions are summarized as follows

“There is no general agreement among urologists as to the best therapy for carcinoma of the prostate

It is held that the possibilities of radical surgery are exhausted, certain features in the natural history of the disease precluding the effective application of this form of treatment

It is shown that there has been gradual improvement in the control of carcinoma of the prostate by radiation

The age incidence and symptoms displayed in a series of 280 cases of carcinoma of the prostate are tabulated

The early diagnosis of the disease is discussed and the use of a new biopsy technic is suggested

Treatment by radiation is discussed High er tissue doses and cystotomy are believed essential to the more effective control of prostatic carcinoma”

In the July issue of the *American Journal of Cancer Research*, 1932, is an important paper on Cancer of the Prostate by Dr Russell S Ferguson of Memorial Hospital, New York City It contains a tabulation of the incidence of early and borderline cancers in supposedly benign prostatic disease as follows

INCIDENCE OF EARLY AND BORDERLINE CANCERS IN SUPPOSEDLY BENIGN PROSTATIC DISEASE			
Authors	Prostates Examined	Early or Borderline Cancer Found	
Wilson and McGrath	468	73	early
Swan	28	4	early
Eastes and Fletcher	678	58	borderline and early
Wade	134	14	early
Thomson Walker	100	16	early
Bugbee	7	7	early
Hirsch and Schmidt	11	11	early
Randall	312	17	early and advanced
Total	1,738	200	

This table is amplified by a clinical index of malignancy as follows

The conclusions are summarized below

‘It is shown that cancer may and does arise in any portion of the prostate or its accessory lobules

“Three clinical types of carcinoma of the prostate are described Each is characterized by its own clinical syndrome, pathological features, and prognosis

‘Pain, other than that due to urinary obstruction or bony metastasis, is held to be pathognomonic of lymphatic extension, especially in the perineural lymphatics

“It is urged that the end results of treatment be evaluated on the basis of the clinical classification of the disease

“The value of aspiration biopsy in the determination of radiosensitivity is stressed

“The selection of therapy is discussed

“The effects of irradiation upon the tissues of the tumor and adjacent structures are enumerated

“An original technic of interstitial radiation, providing greater accuracy in the placement of gold seeds, is described”

A more recent discussion is that by Drs John R Caulk and S B Boon-Itt on Carcinoma of the Prostate in the *American Journal of Cancer Research* of September, 1932 These authors introduce their subject with the statement that-“One of the most vital problems confronting the urological surgeon today concerns the early recognition and treatment of cancer of the prostate” Mention is made of the fact that “The first case of carcinoma of the prostate was recognized by Langstaff in 1817 Billroth in 1867 first attempted to treat this condition by surgery The frequency of the neoplasm was not well recognized until 1900, when Albarrran and Halle intimated that it was not uncommon Since then a number of studies have been made on the subject, various facts have been brought to light, and many helpful suggestions presented by different investigators” The authors state that “In spite of the numerous studies already made, the management of carcinoma of the prostate is still far from satisfactory” They quote various statistics of incidence, more or less contradictory, concluding that “the toll is far from insignificant” They give the following table of microscopic diagnosis of tissue removed from prostates, limited to 107 cases

CLINICAL INDEX OF MALIGNANCY			
Index Factors	Group A (Least Malignant)	Group B (Intermediate)	Group C (Most Malignant)
Age	Over 65	55 to 65	Under 55
Residual urine	200 cc. and over frequent complete retention	100 to 200 cc.	Under 100 cc.
Duration of symptoms	Over 20 months	10 to 20 months	Under 10 months
Extent of disease	No pain, no demonstrable metastases	Pain, no demonstrable metastases	Pain and demonstrable metastases
Prognosis untreated	30 months to many years	7 to 30 months (average 18 months)	Up to 1 year (average 6 months)
Percentage of 501 cases	62 per cent	26 per cent	12 per cent

MICROSCOPIC DIAGNOSIS OF TISSUE REMOVED FROM PROSTATE (107 CASES)		
	Positive	Negative
Tissue removed by Caulk's cautery punch (64 cases)	52 cases (81.4%)	12 cases
Tissue removed by prosta- tectomy (43 cases)	42 cases (97.6%)	1 case
Total	94 cases	13 cases

They mention an instance of cancer of the prostate in a youth seventeen years of age. The mean average age of 194 cases was 63.4 years, the youngest case in the series being 25 and the oldest, 85 years.

Concerning symptoms, the chief complaints were referable to the urinary system in 142 of the 194 cases, or 73.7 per cent with a mean average duration of three years. The chief complaints are given in tabular form as follows:

The authors next discuss the size of the prostate and cystoscopic findings in 105 cases, followed by a study of metastases and necropsy findings in 17 cases. All of this must be consulted in the original since it is not possible to abbreviate it to advantage. They also discuss the question of treatment at considerable length, making this paper one of the most important on the subject ever published. I give the summary of conclusions below. The paper is amplified by an extended bibliography which is very useful.

"The frequency of prostatic cancer warrants attention and demands early recognition. Chronic inflammation of the prostate may be a predisposing cause. The cautery punch operation in conjunction with radium and x-ray therapy appears to be the method of choice for relieving obstruction and retarding the progress of the disease. Seventy-two per cent of the cases thus treated re-

CHIEF COMPLAINTS AS GIVEN BY PATIENTS WHEN FIRST SEEN,
WITH AVERAGE DURATION OF COMPLAINT

	Number of Cases	Average Duration of Complaint
Complaints Referable to Urinary System 143 Cases (73.7%)		
Obstruction to urination (ranging from slight difficulty to retention)	61 (42.6%)	3 years 2 mos
Frequency of urination	51 (35.6%)	2 " 11 "
"Bladder trouble"	16 (11.2%)	3 " 8 "
Painful urination	7 (4.9%)	3 " 1 mo
Nocturia	6 (4.3%)	1 year 10 mos
Hematuria	1	
Dribbling	1	
Total	143 cases	3 years (Average)
Complaints Suggestive of Extension or Metastasis, 42 Cases (21.6%)		
Pain in lower back	14 cases	
Pain in legs	10	
Weakness and loss of weight	8	
Pain in rectum	4	
Gastrointestinal symptoms	4	
Edema of lower extremities	2	
Total	42 cases	
Silent Cases	9 (4.64%)	

The discussion is exceedingly interesting but hardly admits of convenient abbreviation. It includes a discussion of first symptoms as noted in 194 cases: general symptoms, blood picture, blood pressure readings, as to which I give the following tabulation showing the relation of blood pressure to urinary disturbances in 125 cases:

ceived complete relief of obstruction. Twenty-nine per cent of the patients lived or are living over three years; 10 per cent over five years; a longer duration of life than that afforded by prostatectomy. The mortality from the operation in spite of the fact that it was done in many instances upon extremely ill patients upon whom prostatectomy would not have been considered is 2.5 per cent. The mortality rate from prostatec-

RELATION OF BLOOD PRESSURE TO URINARY DISTURBANCES IN 125 CASES

	Total Cases	Blood Pressure Reading Within Normal Variation	Blood Pressure Reading Higher Than Normal Variation	Blood Pressure Reading Lower Than Normal Variation
All cases regardless of com- plaints	125	67 cases (53.6%)	33 cases (26.4%)	25 cases (20.0%)
Cases with urinary symptoms as chief complaints	90	49 cases (54.4%)	30 cases (33.3%)	11 cases (12.3%)
Cases with nonprotein nitro- gen higher than 50 mgm per 100 cc. of blood	21	12 cases (57.1%)	7 cases (33.3%)	2 cases (9.6%)

tomy in this disease in our clinic is 17 per cent. Hospitalization has been less than with prostatectomy. The punch operation affords a definite means of accurately diagnosing cancer of the prostate in 80 per cent of all cases, early or late, which indicates

that the disease, even in apparently early cases, is present throughout the substance of the gland."

American Society for the Control of Cancer,
Chicago, October 7, 1933

PEPTIC ULCER ITS SURGICAL MANAGEMENT*

BY JAMES C. MCCANN, M.D.†

INTRODUCTION

THE rôle of surgery in the management of peptic ulcer should be that of a special therapeutic measure used to cope with complications, or to control those ulcers which fail to respond to medical treatment. Brown¹ at the Sippy Clinic, estimates that twenty per cent of ulcers treated in a medical unit will require surgical treatment. Nielson² concludes from a statistical analysis of a large series of cases treated medically, that whereas sixty per cent of cases with a history of only six months' duration will respond to medical treatment, only five per cent with a history of ten years' duration will so respond. When the period of active symptoms ranged between these time limits, the response to medical treatment varied inversely as the duration of the symptoms. Our experience is that with a large proportion of referred surgical work, operation will be advisable in thirty to fifty per cent of the cases. Many factors such as the age of the ulcer, the extent of the pathology, the complications, the economic status and coöperative capacity of the patient, will determine the number of lesions requiring surgical treatment.

The operative technique for treatment of ulcer of the stomach and duodenum is after fifty years of progress, highly developed and standardized. That point is now reached where a surgeon must individualize each ulcer as viewed at the operating table, and select the operation best suited to each particular lesion. This selection will be done accordingly as one adheres to the precepts of the school which recommends conservative or radical surgery for ulcer. The selection must be made quickly, with a soundness of surgical judgment which equals in importance the accuracy and facility with which the operation itself is done. Adhering to the school of conservative surgery, we found a review of 105 consecutive cases operated upon during the period between January, 1930 and September, 1932 by Drs. M. F. Fallon, John Fallon and the author, to be instructive. The series includes a comprehensive list of operative procedures which meet satisfactorily most of the exigencies which arise in the surgical manage-

ment of ulcers. It emphasizes the need of complete familiarity with this field, if a surgeon is to do full justice to patients who submit themselves for operation upon this vital organ.

The factors which condition the selection of the type of operation best suited for a particular ulcer are two, namely, the extent of the lesion, and its location. The larger, more indurated and calloused is the ulcer, and the farther its location shifts from the duodenum across the pylorus into the stomach, the more extensive will be the operation required. Our series, though small, bears out this generalization, and emphasizes the need for full mastery of all technical methods used in this field, if all situations are to be met adequately.

DUODENAL ULCER

I. Pyloroplasty

- A. Partial Duodenectomy (Fig. 1A)
- B. Partial Duodenectomy and Cauterization (Fig. 1B)

A partial duodenectomy is the most conservative operation for ulcer, and is applicable only to simple ulcers. Two factors condition its use, first, the lesion must be small, in the first half inch of the anterior wall of the duodenum, and free of all extensive adhesions and deforming cicatrices; secondly, the first portion of the duodenum must be sufficiently long, mobile, and wide to permit free delivery from the abdomen. A fore-shortened duodenum retracted by a calloused ulcer against the spine, is not suited to this procedure. Brief technical descriptions of each type of operation will be given.

Technique (Fig. 1A) The stomach is delivered and retracted to the left. The pyloric vein is ligated at the greater and lesser curvatures. Through a small longitudinal incision in the middle of the anterior wall of the stomach one inch proximal to the pylorus, the stomach contents are aspirated. Beginning at this incision, a rectangular piece of gastric and duodenal wall, including the ulcer, is excised. Two lines of excision extend from the first incision toward the greater and lesser curvatures at the pylorus thus removing half the sphincter. From the pylorus the lines of excision converge to a point in the middle of the first portion of the duodenum beyond the ulcer. This excised tissue contains the ulcer and the anterior third of the sphincter. The edge of the gastric mucosa is sutured to the edge of the duodenal mucosa in a longitudinal direction. This layer is infolded

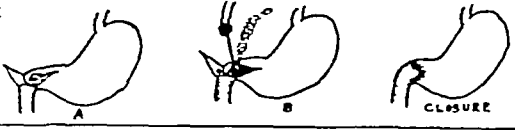
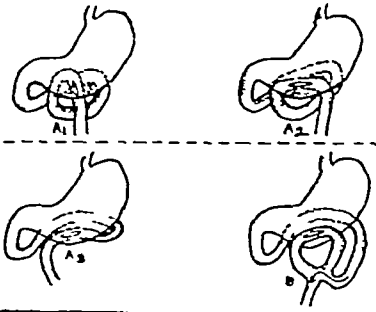
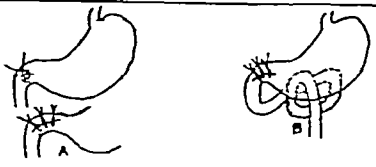

*Read before the Worcester County Medical Society Meeting at St. Vincent Hospital, Worcester, December 13, 1933.

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by a second seromuscular suture line. This line is reinforced by omental tabs.

B Partial duodenectomy and cauterization are used when an anterior wall ulcer suitable for pyloroplasty is associated with a posterior wall, or "kissing ulcer." The latter ulcer, usu-

series Judd³ thinks that it may be applied to fifty per cent of ulcers. Two of our series had associated posterior wall ulcers which were destroyed by cautery. The merit of pyloroplasty is that it removes the ulcer, but retains the normal continuity of the gastro-intestinal tract. The

DUODENAL ULCER 91 OPERATIONS				DIAGRAM	
TYPE OF OPERATION	NO.	TYPE ULCER	TECHNICAL FACTORS		
I. PYLOROPLASTY A PARTIAL DUODENECTOMY	5	SMALL ANT. WALL ULCER 1/2 OF PYLORUS	MOBILE DUODENUM NO CICAtrices	I	
	3	POSTERIOR WALL KISSING ULCER			
II. GASTRO-ENTEROSTOMY A POSTERIOR 1 VERTICAL 2 TRANSVERSE ANTI-PERISTALTIC 3 ISOPERISTALTIC	59	CICAtrIX DEFORMITY		II	
	8	CRATER			
	4				
	3	SAME			
III. CLOSURE PERFORATION A SIMPLE CLOSURE	4	CICAtrIX DEFORMITY PERFORATED	OVER 6 HOURS POOR RISK	III	
	3	SAME	UNDER 6 HOURS GOOD RISK STENOSIS PYLORUS		
IV. DIVINE EXCLUSION	2	CICAtrIX DEFORMITY PENETRATION BURN MARKS	POOR RESECTION FROM G. E. OPEN PYLORUS POOR RISK FOR RESECTION	IV	

ally exposed after the anterior wall ulcer has been excised, is typically a crater type, located just beyond the pylorus.

Technique (Fig. 1B). The anterior wall ulcer is excised in the manner described above. The posterior wall ulcer is well exposed and the surrounding duodenal wall protected by moist packs. The lesion is cauterized until the base is destroyed and the mucosal edges around the ulcer are freed. The free mucosal edges are then approximated over the crater defect by deep interrupted catgut sutures. The plastic repair is then carried out in the manner described.

Discussion. Pyloroplasty was first performed by Heinecke in 1886 and independently by Mikulicz in 1887. It consisted originally of a longitudinal incision through the pylorus which was resutured in a vertical direction, thus increasing the width of the opening at the pylorus. Since then many forms of plastic operations have been devised. Finney published his original method in 1902. Since then other methods have been developed by Horslev, Balfour, and Judd, and have been widely used. Balfour suggested the cautery destruction of ulcers in 1914.

We used pyloroplasty in eight cases of our

operation described above removes half the pyloric sphincter and cripples the muscular action of the distal portion of the antrum. This factor and the widened lumen overcome spasm and the retention of acid and permit more rapid emptying of the stomach. It may also reduce the acidity of the gastric juice by permitting a freer regurgitation of alkaline duodenal juices into the stomach. Satisfactory results are obtained in eighty per cent of operations, with some relief in the others. In the few cases in which ulcers recur, the whole field of more radical surgery is still available.

II. Gastro-Enterostomy

A. Posterior

1. Vertical (Fig. IIA₁)

2. Transverse { Antiperistaltic (Fig. IIA₂)
Isoperistaltic (Fig. IIA₃)

B. Anterior with Entero-enterostomy (Fig. IIB)

A. Posterior gastro-enterostomy, the next least radical operation to pyloroplasty, is used

when exploration reveals an extensive cicatrized ulcer of the duodenum which foreshortens, contracts, or obstructs the duodenum. A direct attack upon such extensive pathology by a plastic operation would not be feasible. An indirect drainage operation to induce healing of the ulcer is offered by gastro-enterostomy. The anastomosis of the jejunum to the stomach may vary in three particulars, first, in whether the anastomosis is placed on the anterior or posterior wall of the stomach, secondly, in the direction in which the jejunum is apposed to the stomach wall, vertically or transversely, thirdly, in whether the loop of anastomosed bowel (transverse), passes in the direction of gastric peristalsis (isoperistaltic), or in the reverse direction (antiperistaltic). The posterior vertical type of anastomosis we used whenever possible.

Technique (Fig IIA, A, A₂) For a posterior type, the stomach, transverse colon and omentum are delivered and rotated on a transverse axis. A fold of the posterior wall of the stomach is delivered through a rent in the mesocolon. The dependent point of the posterior wall is grasped with an Allis forceps. The posterior wall is delivered further by traction on the forceps, and by freeing adhesions from the pancreas, until the lesser curvature is freely delivered. Here a second Allis forceps is placed a half inch nearer the pylorus than the Allis at the greater curvature. These two markers establish an approximately vertical line in the mid portion of the posterior wall of the stomach. The edges of the mesocolic rent are sutured high on the posterior wall of the stomach on each side of the fold in the Allis clamps. The fold is then caught in a rubber-covered clamp. The jejunum is accurately identified where it emerges from under the mesocolon and a loop of it caught in a rubber covered clamp as close to the point of emergence as may be done without tension. The clamp is approximated to that on the posterior wall of the stomach. The apposed serous surfaces are united by a seromuscular continuous catgut suture for a distance of three inches. The serosa and muscularis of the stomach are incised for a little less than three inches parallel to the suture line and a quarter of an inch away from it. The vessels in the submucosa are doubly clamped. The mucosa and submucosa are incised in a line between these clamps and the vessels tied. All layers of the jejunum are cut through by a similar incision. The adjacent inner edges of the openings in the stomach and jejunum are united by a continuous catgut suture through all coats. This suture is continued along the outer mucosal edges, thus establishing the anastomotic stoma. The clamps are removed and the seromuscular suture line is resumed and carried anteriorly infolding the mucosal suture line. In the transverse type of anastomosis the two Allis forceps are placed at the ends of a four inch fold close to and parallel with the greater curvature and as close to the pylorus as possible. This fold is caught in a rubber covered clamp. A loop of jejunum is caught in a clamp passing in the direction of gastric peristalsis (isoperistaltic), or in the reverse direction (antiperistaltic) and the two approximated. The anastomosis is then made in the manner described.

enterostomy is used for the same type of lesion as above, when technical factors make a posterior anastomosis inadvisable. Such factors are a narrow costal arch with a high lying stomach, extreme deposits of fat in the mesocolon, or fore shortening of the mesocolon. We encountered one contracted mesocolon, shortened to an inch by adhesions from an attack of peritonitis in early life. Reformation of adhesions would have endangered the stoma of a posterior gastro-enterostomy. The patient was not a satisfactory risk for resection because of recent severe hemorrhage, so an anterior gastro enterostomy was done.

Technique (Fig IIB) The jejunum is identified and carried up over the colon and omentum to the anterior surface of the stomach. The loop is alternately shortened and lengthened, and approximated to the stomach at a point where it swings without tension around the transverse colon and omentum. This is usually about eighteen inches beyond the duodenojejunal flexure. A segment is caught in a rubber covered clamp and apposed to a line on the anterior wall of the stomach three or four inches proximal from the pylorus and near the greater curvature. An anastomosis to the stomach is made as described under posterior gastro-enterostomy. After it is completed the afferent loop is attached to the stomach above and proximal to the anastomosis by a few interrupted sutures so as to prevent kinking. This must be supplemented by an entero-enterostomy between the afferent and efferent loops of the jejunum, so as to drain the secretions from the proximal loop and prevent its dilatation by secretions. A point is selected in the proximal loop distal to where it turns upwards around the colon and omentum and three inches of it are caught in a rubber covered clamp. A corresponding point on the descending loop is similarly placed in a clamp, and the two are approximated. A posterior seromuscular suture is placed between the two loops. Both loops are opened by incisions parallel to the line of anastomosis. The inner mucosal edges are sutured together by a continuous through and through suture, which is continued anteriorly thus establishing the stoma. The seromuscular layer is then continued anteriorly infolding the mucosal suture line.

Discussion Gastro enterostomy was first performed by Wolfer (1881) at the suggestion of his assistant Nicoladoni. It was a long loop anterior type, done for cancer of the pylorus, and postdated by two years Péan's attempt at pylorotomy (1879). Braun many years later (1892) suggested an entero entero anastomosis between the afferent and efferent loops of the long loop anterior anastomosis. Courvoisier first performed a posterior (retro colic) gastro-enterostomy in 1882, but the patient succumbed on the thirteenth day from peritonitis. In 1885 v Hacker improved on this method of posterior gastro-enterostomy by carefully identifying the proximal jejunum where it emerges from under the mesocolon, and by suturing the rent in the mesocolon to the posterior wall of the stomach. Peterson first suggested a short loop posterior gastro enterostomy, and it was first used by his

Anterior gastro-enterostomy with entero-

chief Czerny in 1901. Gastro-enterostomy was used originally only for obstructing carcinoma. Doven in 1898, first used it for duodenal ulcer.

In our series gastro-enterostomy was done in eighty-one instances. Only three of these were anterior types of anastomoses. Of the seventy-eight posterior anastomoses, sixty-eight were of the vertical type, seven were transverse antiperistaltic types, and three were transverse isoperistaltic types. The posterior type of anastomosis is preferable because it can be most quickly done, and because it has the lowest incidence of gastro-jejunal ulcers. A transverse type of anastomosis was used when a high lying small stomach, obesity, or extensive adhesion of the posterior wall of the stomach to the pancreas, made free delivery of the stomach for a vertical type of anastomosis too difficult. The antiperistaltic direction was preferred in transverse anastomoses as the loop hung more satisfactorily in this position. Occasionally the isoperistaltic direction gave a more freely hanging loop when the jejunum passed from under the mesocolon far over to the left of the midline, or when it had a short immobile mesentery.

Gastro-enterostomy is an indirect operation intended to aid the healing of an irremovable ulcer, and to protect its host from the complications of a progressing chronic ulcer. This is accomplished by mechanical and chemical means. Mechanically, it drains part of the chyme and coarse irritating food from the stomach, through the new stoma into the jejunum, thus shortening the emptying time. This relieves the ulcerated duodenum from exposure to the whole meal during the entire period of normal emptying. When the period of normal digestion is completed, the relaxed stomach permits the final free acid aliquot to drain directly through the stoma into the jejunum, thus sparing the ulcer from the action of free hydrochloric acid. Chemically, the alkaline duodenal juices which are drained back into the stomach lower somewhat the concentration of the acidity of the juice.

The result of gastro-enterostomy for definite chronic ulcers, has proved highly satisfactory in American clinics. There is a marked uniformity in the reports of eighty to ninety per cent satisfactory results from all but a few clinics. Jejunal ulcers are reported at from two to five per cent in most clinics, quite at variance with the figure thirty-three per cent reported from Mt. Sinai in New York, and from the Continent. The rôle of this operation is not only cure, but also protection from complications. Perforation, which occurs in possibly five per cent of chronic ulcers, is extremely rare after gastro-enterostomy, hemorrhage is reduced from an incidence of fifteen to twenty-five per cent with a mortality of three to five per cent, to an incidence of about nine per cent with a negligible mortality, recurrent symptoms which are difficult to control before operation, are easily controlled by moderate dietetic care after operation. In the

two to five per cent of recurrent ulcers, the whole field of more radical surgery is still available.

III CLOSURE OF PERFORATED ULCERS

A Simple Closure (Fig IIIA)

B Closure with Gastro-enterostomy (Fig IIIB)

The most serious type of duodenal ulcer is one which has perforated into the peritoneal cavity. There were eight perforated ulcers in our series, all located in the duodenum within a few centimeters of the pylorus. A calloused indurated area two or three centimeters across usually surrounded the point of perforation. The problem which confronts the surgeon at the time of operation is whether simple closure shall be done or whether a gastro-enterostomy shall be done in addition to the closure. In making a decision we were influenced by three factors: the first, the length of time that elapsed between perforation and operation—after six hours a gastro-enterostomy was not done, the second, the risk of operation as determined by the age and general condition of the patient, and the third the degree of obstruction in the duodenum caused by the closure of the perforation.

Technique (Fig IIIA, B). A purse-string suture of catgut is passed around the ulcer and drawn sufficiently tight to close the perforation. Interrupted mattress sutures, usually three, are placed and tied so as to infold the purse-string suture. Omental tabs are sutured over the closure. If a gastro-enterostomy is added it is done according to the conditions prescribed above.

Discussion. Acute perforation of a duodenal ulcer was first described by Joseph Penada of Padua in 1793. Mikulicz advised simple suture of perforated ulcer in 1880, and this was first done successfully by Heussner in 1892. Moynihan suggested adding gastro-enterostomy to simple closure in 1901. In our series four were treated by simple closure, and four by closure with gastro-enterostomy. Those who advocate the addition of gastro-enterostomy usually limit this step to those cases which are operated upon within six hours of perforation, because a simple chemical and irritant peritonitis changes then to a septic type of peritonitis. The mortality rate increases directly as the time between perforation and operation increases. It varies from six per cent after operation within ten hours, to sixty per cent for operation after thirty hours. One perforation in our group of eight died. It was a case which had been perforated ten hours at the time of operation, a simple closure was done but the patient developed a subdiaphragmatic abscess and died. Probably fifteen per cent of the ulcers treated by simple closure will require a subsequent operation for recurrence of symptoms. The incidence of gastrojejunal ulcer at the stoma of

gastro-enterostomies done at the time of operation is placed at about two per cent by most writers

IV Devine Resection by Exclusion




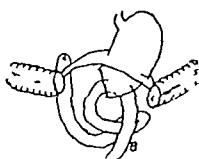

The next most complicated group of duodenal ulcers is the type of cicatricial lesion described above which is complicated by hemorrhage or threatened perforation. Such a lesion, associated with a patulous pylorus, would not be protected adequately by gastro-enterostomy. After a gastro-enterostomy, enough irritating chyme would pass through the patent pylorus to irritate the ulcer and prevent its healing, and possibly result in perforation or hemorrhage. These dangers are not, however, so imminent as to warrant extensive resection for all such lesions. A satisfactory compromise with adequate protection is afforded by the Devine operation, or resection by exclusion.

Technique (Fig IV) This operation approaches the types of radical resections to be described later. The stomach is transected along an oblique line from the angle of the lesser curvature to a point proximal to it on the greater curvature. The distal opening is closed by a continuous suture, and infolded by a seromuscular suture, thus excluding the antrum and duodenum from the food stream. The proximal cut end of the fundus is sutured to the jejunum in one of four ways, the open end of the fundus may be anastomosed directly to the side of the jejunum

as a retro-colic anastomosis, or as an anti-colic anastomosis with entero-enterostomy, or the open end of the fundus may be closed and the jejunum brought up and anastomosed side to side as either a posterior or anterior gastro-enterostomy.

Discussion This operation was first reported by Devine in 1925. It has been used by many surgeons since then, and recently Lahey⁴ recommended it as an operation of value for bleeding duodenal ulcers which require operation. We used it for two cases in our series. One was a patient who had recovered spontaneously from a perforated ulcer, and who had suffered a severe hemorrhage with threat of a second perforation. The other patient had a deep penetrating, bleeding crater ulcer associated with a large duodenal diverticulum and patulous pylorus. Neither case would have been protected adequately by a gastro-enterostomy, and each was too poor a risk for radical resection. The resection by exclusion solved both problems satisfactorily. Devine claims the same advantages for his operation, as for the more radical resections, but with less risk. There is a great reduction in the concentration of the acid, the stomach empties more rapidly, and there is freedom from unpleasant after-effects. Two patients on whom Devine performed this operation were reoperated by him in about twelve

GASTRIC ULCER 12 OPERATIONS

TYPE OF OPERATION	NO.	ULCER	TECHNICAL DATA	DIAGRAM
I PYLOREPLASTY	1	SMALL ANTRAL OR PARAPYLORIC	MOBILE D. SOFT M. NO CATRICES	IX SEE I
II PYLORECTOMY BILLROTH + (HORSLEY)	2	DISTAL HALF ANTRUM		XI 
XII EXCISION (CAUTERY) AND GASTROENTEROSTOMY	1	ULCER AT ANGLE OF STOMACH	SMALL ULCER	XII 
XIII PARTIAL RESECTION A POLYA	2	PROXIMAL HALF ANTRUM GASTRIC AND DUODENAL ULCER		XIII 
IV BILLROTH II	1	SAME	LARGE RELATED RUPTURE W. E. RESECTION BY REMAL POUCH	
V TRANSSTOMIC CAUTERY AND GASTROENTEROSTOMY	1	ULCER WHOSE P. IS A R. WALL		XIV 
VI GASTROENTEROSTOMY HIGH CARDIAL ULCER	4		BEYOND CAT. I OR RE-ECTY M	XV SEE II

months, and he found the excluded antrum contracted and empty. We made a similar observation on one of our cases upon whom we reoperated a year later. Studies on experimental animals have shown that the excluded antrum atrophies and becomes functionless. Devine claims excellent results in forty cases which were treated in this fashion.

GASTRIC ULCER

As the location of an ulcer shifts from the duodenal to the gastric side of the pylorus, the variety and extent of the operative procedures necessary to cope with it increase. This is due to the necessity of removing or destroying all chronic gastric ulcers, as ten to fifteen per cent of them probably undergo malignant change.

V *Pyloroplasty*

This very conservative procedure is applicable in the very few instances in which the gastric ulcer is located on the anterior wall of the stomach close to the pylorus. We could use it for only one gastric ulcer in our series.

VI *Pylorectomy Billroth I*

Ulcers located in the distal half of the antrum but too far proximal from the pylorus to be suited for excision and plastic repair, are best treated by pylorectomy. This operation, as devised by Billroth, consists in removal of a sleeve of tissue from the stomach between the pylorus and a point proximal to the lesion, and uniting the stomach and duodenum in direct continuity.

Technique (Fig VI). The pyloric and right epiploic vessels are ligated at the pylorus. A crushing clamp is placed across the pylorus and a non-crushing clamp across the first portion of the duodenum which is transected between them. The gastrohepatic and gastrocolic omenta are ligated in sections over to the line of transection proximal to the ulcer. Here the vessels at the lesser and greater curvatures are ligated and the stomach transected between two clamps. With the ulcer-bearing area thus removed the open end of the fundus is approximated to the open end of the duodenum and they are anastomosed end to end. The posterior serosal surfaces are first sutured together by a continuous catgut suture. The posterior edges of the two openings are then sutured together by a through and through continuous catgut suture. This is continued anteriorly to approximate the mucosal layers thus establishing the stoma of the anastomosis. The posterior seromuscular suture line is then continued anteriorly infolding the mucosal suture line. If the opening of the duodenum is too small to unite to the opening in the stomach accurately the anterior wall of the duodenum may be slit longitudinally for a distance sufficient to compensate for the discrepancy in the circumferences. The completed suture line is protected by omental tabs.

Discussion. Resection of the stomach antedates the more conservative operations of pyloroplasty and gastro-enterostomy. In 1810 Mer-

ren of Giesen resected the pylorus of dogs giving credit for the idea to an unnamed Philadelphia surgeon. Prior to 1877 Gussenbauer and von Winwater, also Czerny and Kaiser, had successfully resected the stomach of dogs. In 1879 Péan, the great French surgeon, resected the stomach of a man for the first time. The patient survived for five days. In 1880 Rydiger, influenced by the experimental work of Gussenbauer and von Winwater, of Wehr, and by the experience of Pean, performed the second unsuccessful resection of the pylorus in man. In 1881 Billroth reported the first successful resection done on a man for carcinoma of the pylorus. In the same year Rydiger treated a large ulcer of the posterior wall of the stomach by resection, seventeen years before the first gastro-enterostomy was done for an ulcer. In 1903 Rodman suggested pylorectomy for all gastric ulcers, to remove the ulcer-bearing area of the stomach. We found the Billroth I operation best suited to two cases of gastric ulcer in our series. It represents the most physiologic of the more radical operations on the stomach, because the direct continuity of the tract is maintained, and the contents of the stomach are emptied directly into the duodenum as before operation. The results are satisfactory in ninety per cent of cases, with an occasional recurrence of ulceration or stenosis at the suture line.

VII *Local Excision (Cauterization) and Gastro-enterostomy*

Ulcers located higher on the lesser curvature near the incisura angularis are more amenable to direct surgical attack than ulcers located elsewhere in the stomach. Formerly a sleeve resection of tissue containing the ulcer was made from the whole circumference of the stomach, and the open ends anastomosed in direct continuity. This operation has been abandoned because of the subsequent disturbance in the motility of the stomach, and the occurrence of hour-glass contractures at the suture line. Excellent results have been obtained by local excision of such an ulcer and the addition of a gastro-enterostomy. One case of gastric ulcer which we treated in this manner had bled before operation and was a poor risk for resection.

Technique (Fig VII). The stomach is delivered well from the abdomen. The gastrohepatic omentum is dissected free from the ulcerated area and if necessary the pyloric and coronary vessels are ligated on each side of the ulcer. Two V shaped segments of tissue are excised, one from the anterior wall and one from the posterior wall, the base of each meeting at the lesser curvature so as to include the ulcer. The two edges of the V on the anterior wall are approximated and also those on the posterior wall and the mucosal edges sutured together by a continuous catgut suture. A seromuscular suture infolds the first suture line. The gastrohepatic omentum is sutured back in place. If preferable the ulcer may be destroyed by cautery burning well out into the surrounding healthy tissue. The defect is

then closed and covered by omental tabs. Which ever procedure is used, it should be followed by a gastro-enterostomy.

Discussion This method is less formidable than a radical resection, and meets satisfactorily the requirements of the situation. Balfour (1914) first suggested the destruction of such ulcers by the cautery, but it has the disadvantage that it destroys the specimen for pathologic examination. Local excision or cautery destruction alone does not suffice, because of the consequent disturbance of motility, and the high incidence of recurrent ulcers. A gastro-enterostomy is necessary to avoid disturbance in the mechanism of the emptying of the stomach. This combination has proved so satisfactory that Balfour considers it the operation of choice for ulcers at the angle of the stomach.

VIII Partial Gastric Resection

A Polya (Reichel and Balfour)
(Fig VIIIA)

B Billroth II (Fig VIIIB)

Frequently an ulcer will be so situated in the proximal half of the antrum that it cannot be removed by the methods described above. For an extensive lesion in the proximal half of the antrum, or for an antral lesion associated with a duodenal ulcer, both of which are to be removed, a more adequate resection becomes necessary. The two types of procedures we used in such situations were the Polya or Billroth II types. In the Polya type a wide sleeve of stomach wall between the fundus and the pylorus is resected, and the open end of the fundus is sutured to the side of the jejunum. In the Billroth II type, the same wide resection is made, but the stump of fundus is closed, and the jejunum is brought up and anastomosed to the fundus as a gastro-enterostomy.

Technique—Polya (Fig VIIIA) The stomach is delivered and the proximal line of resection determined near the angle of the stomach. Two and a half centimeters proximal to where this proximal line crosses the lesser and greater curvatures the vessels are doubly ligated and cut. From this point the gastrohepatic omentum and the gastroduodenal omentum are tied off in sections from left to right, over to the first part of the duodenum. The duodenum is transected between crushing clamps. The duodenum is closed by a running suture over the clamp which inverts it as the clamp is removed. An additional serosal suture line inverts the closed end more completely and it is covered with omental fat or sutured to the pancreas. The proximal crushing clamp at the pylorus is turned over to the left elevating the antrum and exposing the posterior wall of the stomach. In the Reichel method of anastomosis the jejunum is brought up through a rent in the mesocolon and approximated to the posterior surface of the stomach so that the proximal end of the jejunum meets the lesser curvature. A seromuscular suture line unites the jejunum and posterior wall of the stomach proximal to the line of resection at the antrum. The stomach is cut across one and a half centimeters distal to the suture line, thus removing the

whole antrum of the stomach. The jejunum is then opened for a distance corresponding to the opening in the stomach. The inner mucosal layers of the stomach and jejunum are sutured together by a continuous through and through catgut suture. This is continued anteriorly, suturing the outer mucosal layers of the stomach and jejunum, thus establishing the anastomotic opening. The posterior seromuscular suture line is continued anteriorly infolding the anterior mucosal suture line. When this anastomosis is completed, the bowel and stomach are drawn down through a rent in the mesocolon, and the edges of the rent are fixed high on the stomach with interrupted sutures. This is Reichel's modification.

Balfour suggests a long loop anterior anastomosis with an entero-enterostomy, instead of this retrocolic type which is frequently impossible without tension. The resection is carried out as above to the point where the anastomosis between the jejunum and stomach is ready. As described under anterior gastro-enterostomy the jejunum is adjusted so that it swings in front of the omentum and colon without tension and is approximated to the posterior surface of the stomach. The resection of the antrum and the anastomosis of the jejunum to the stomach are carried out as described above for the Reichel type of retrocolic anastomosis. An entero-enterostomy between the afferent and efferent loops of the jejunum is made as described under anterior gastro-enterostomy. If in either type of anastomosis the opening in the fundus is too large to be used for a stoma, this may be circumvented by closing a quarter of the opening of the fundus at the lesser curvature end, and using the remaining three-quarters of the opening for the anastomosis, as suggested first by Hoffmeister.

Technique—Billroth II (Fig VIIIB) This method affords another way than Hoffmeister's, for anastomosing a fundus with a large opening, to the jejunum. The resection of the antrum is carried out as described for the Polya, as far as the complete closure of the duodenum. Two large Payr clamps are placed across the stomach at the proximal line of resection, and the stomach is cut between them. This removes the antrum. The stump of the stomach in the proximal clamp is turned up with the transverse colon and omentum. An opening is made in the transverse mesocolon and a gastro-jejunosomy done with the jejunum applied vertically to the posterior wall of the stomach. The anastomosis may also be made as a long loop anterior type with entero-enterostomy. The cut end of the fundus is closed by a running suture over the clamp which inverts the stomach when the clamp is removed. This is reinforced by a second inverting seromuscular suture and the whole is protected by covering the suture line with the lesser omentum.

Discussion Billroth introduced partial gastrectomy in the form of his Billroth I pylororectomy in 1881, and introduced his Billroth II modification in 1883 to avoid the fatal leaking angle at the lesser curvature portion of the suture line in his number I method. The modification of the gastrojejunal anastomosis whereby the open end of the stomach was implanted into the side of the jejunum by the retrocolic route was introduced by Reichel in 1908, and independently by Polya in 1911. The Reichel-Polya re-

trocolic anastomosis was modified to an antecolic type with entero-enterostomy between the afferent and efferent loops by Balfour in 1917. We used the Polya types of anastomoses in two of our resections, one of which was done after reducing the lumen of the open stomach by the Hoffmeister method. We used the Billroth II anastomosis in one case with an extensive resection which left a small sac of fundus with such a large opening, that closure of the end of the stomach and side to side anastomosis of the stomach and jejunum offered the most satisfactory type of anastomosis. Such resections besides removing the ulcer-bearing portion of the stomach establish a low acidity and have as a consequence a lowered incidence of gastrojejunal ulcer. These more radical operations do carry a higher mortality rate, thirteen to fifteen per cent, than the more conservative operations and for this reason are not the operations of choice for all benign gastric and duodenal ulcers.

IX *Transgastric Cauterization and Gastro-enterostomy*

As the site of the ulcer moves from the angle of the stomach into the poorly accessible parts of the stomach, as on the posterior wall of the fundus, the danger of radical resection far outweighs any potential danger from the lesion itself. More conservative methods may be used to cope with them. An ulcer of the posterior wall of the fundus may be excised or may be destroyed by transgastric cauterization, through an incision in the anterior wall of the stomach. Either procedure should be followed by a gastro-enterostomy. In our series one such posterior wall ulcer of the fundus which had recurred after a year of intensive medical treatment, was handled in this manner.

Technique (Fig. IX). The stomach is delivered from the abdomen. An incision is made high in the anterior wall of the fundus in its longitudinal axis and overlying the ulcer on the posterior wall. The ulcer is excised or surrounded by moist packs and cauterized until its base is destroyed and the mucosal edges around the crater are freed. Deep catgut sutures are laid from one side of the ulcer to the other so that when tied the edges of the mucosa are approximated. The incision in the anterior wall of the stomach is closed and the procedure is completed by the addition of a gastro-enterostomy according to the principles prescribed.

Discussion. The transgastric excision of posterior wall ulcers was popularized by W. J. Mayo. Their destruction by cautery, popularized by Balfour, is a technical modification of the procedure. The results are very satisfactory.

X *Gastroenterostomy for Ulcers of Cardia*

The ulcers most difficult of access are those located high in the cardia near the esophagus. Here they are not resectable or amenable to destruction by cautery with any degree of safe-

ty. However, this type of lesion will respond satisfactorily to simple gastro-enterostomy. The literature conveys the impression that ulcers located proximal to the point of gastro-enterostomy will not heal satisfactorily. This has not been the experience of many competent observers. These ulcers of the cardia have responded satisfactorily to gastro-enterostomy in seventy per cent of cases. In very intractable ulcers of this type Balfour suggests jejunostomy for complete rest of the stomach. We had four such ulcers in our series and all have responded satisfactorily to simple gastro-enterostomy. One case in particular that we have seen frequently for a period of two years following operation obtained immediate and complete relief from constant incapacitating pain of several years' duration.

GASTROJEJUNAL ULCERS

This group represents secondary lesions initiated by and developing after an operation for a primary ulcer. A gastrojejunal ulcer is a new and distinct ulceration at the site of a gastrojejunal anastomosis and a gastro-jejuno-colic fistula is the complicating erosion of such an ulcer into the colon. The management of such lesions presents the most complicated technical problems in the surgery of peptic ulcer. Depending upon the conditions present the steps consist essentially in disconnecting the gastro-enterostomy, excising the ulcer and doing such a type of gastrointestinal anastomosis as is indicated.

XI *Disconnection of Gastroenterostomy and—*

- A Polya or Billroth Resection
- B Polva or Billroth Resection
- C Roux-en-Y anastomosis


Occasionally it will be found after disconnecting a gastroenterostomy and excising the jejunal ulcer that the duodenal ulcer for which the anastomosis was originally made has healed. Nothing further need be done except to close the defects in the stomach and jejunum. Subsequently the patient's diet should be regulated. Sometimes after disconnection of the anastomosis, a small ulcer of the duodenum will be found which is suitable for excision. One case in our series was treated in this manner with excision of the ulcer and a plastic repair following closure of the defects in the stomach and jejunum. The method of choice, however, is to follow disconnection of the anastomosis by a partial gastric resection, which will minimize the likelihood of further ulceration.

Technique. The stomach, colon and omentum are elevated and rotated on a transverse axis until the anastomosis between the jejunum and stomach is exposed. The mesocolon is freed from the posterior surface of the stomach where it was fixed around the line of anastomosis. The posterior wall of the stomach is caught on each side of the anastomosis with Allis clamps and

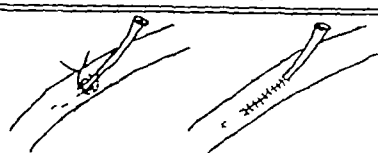

pulled well down through the reestablished rent in the mesocolon. A circular incision is made in the wall of the stomach surrounding the line of anastomosis, so as to remove a cuff of the stomach wall about a half inch in width. A rubber-covered clamp placed across the posterior stomach wall above the anastomosis, keeps the field clean. A ring of jejunal tissue of sufficient width to include the ulcer, is cut from the anastomosed portion of the mobilized jejunum. These steps remove a napkin ring piece of tissue, composed of gastric and jejunal tissue at the anastomotic line and the ulcer. If no further re-

Technique (Fig XIB) The gastro-enterostomy was disconnected in the manner described. The fistula into the colon was closed by a purse-string catgut suture. It was infolded by another suture line and covered with omentum. Six inches of inflamed thickened jejunum in the region of the ulcer had to be resected. The distal segment of the jejunum was drawn up to the anterior surface of the stomach and its cut end was closed by two rows of inverting sutures. The now closed distal loop was anastomosed to the anterior surface of the stomach in the form of an anterior gastro-enterostomy. The open end

GASTRO-JEJUNAL ULCER 2 OPERATIONS

TYPE OF OPERATION	NO	TYPE ULCER	TECHNICAL FACTORS	DIAGRAM
XI DISCONNECTION, GASTROENTEROSTOMY AND A PYLOROPLASTY	1	JEJUNAL ULCER SMALL ULCER DUODENUM	MOBILE DUODENUM NO CICATRICES	XI SEE T
B ROUX EN Y	1	JEJUNAL ULCER JEJUNO-COLIC FISTULA OBSTRUCTED PYLORUS DANGEROUS RISK	DUODENUM FIXED DRAINAGE NECESSARY	
C POLY	0	SAME		SEE VIII A

ACCESSORY OPERATIONS

TYPE OF OPERATION	NO	TYPE	DIAGRAM
XII JEJUNOSTOMY	2	POOR RISK VICIOUS CIRCLE	
XIII ENTERO-ENTEROSTOMY	1	VICIOUS CIRCLE	

section of the stomach is to be made, the defect in the stomach is closed by two inverting suture lines. The defect in the jejunum is closed in a transverse direction by two rows of continuous catgut. If further surgery is necessary, either a pyloroplasty or a partial gastrectomy is done according to the indications and according to the principles discussed under each operation.

Occasionally a Roux en Y operation will solve a difficult problem after an old anastomosis has been disconnected. We used it on a fifty-five year old man with a gastro jejunal ulcer and jejuno-colic fistula, who was admitted to the hospital following a severe hemorrhage. There was a persistent complete pyloric obstruction, for which the original gastro enterostomy had been done. After resection of the anastomosis and ulcer, there was absolute need for further surgery, but it was apparent that the patient would not survive a partial gastrectomy. A Roux en Y anastomosis was made as quickly as possible.

of the proximal segment of jejunum was brought over to the side of the distal segment below where it hung from the stomach. The cut end of the proximal loop was then anastomosed to the side of the distal loop three to four inches below the line of anastomosis to the stomach, thus draining the bile and pancreatic juice into the jejunum below the point of anastomosis.

Discussion Roux introduced this type of operation in 1897 to eliminate the fatal vicious circle of vomiting which was fairly common with the early long loop types of anastomosis. This complication has been practically eliminated by the posterior short loop type of anastomosis now used. The Roux operation is not widely used as it is not sound physiologically. The gastric juice of full acid strength is poured directly onto the jejunal mucosa deprived of the usual protection of the alkaline bile and pancreatic juice. In a gastroenterostomy these juices flow down over the anastomotic area from above, but after the

Roux en Y anastomosis they enter the bowel four inches below the line of anastomosis. As a consequence this type of operation is followed by gastrojejunal ulcer in too high a percentage of cases to warrant its use. However it is a valuable emergency operation in some situations, and as Dr Balfour once remarked "it is an operation that will get you out of a tight place."

ACCESSORY OPERATIONS

There are two operations which do not aim directly at the control of an ulcer itself, but which are of great value in meeting emergency situations which occasionally arise in the general surgical management of peptic ulcer. These are jejunostomy and entero-entero-anastomosis.

XII Jejunostomy

Witzel introduced the principle of suturing a catheter into the gastrointestinal tract in 1891. We used it once to improve the condition of an emaciated patient who came to the hospital vomiting excessively from a mal-functioning gastroenterostomy performed elsewhere. Balfour recommends it for large ulcers high in the cardia, or for large inflammatory gastrojejunal ulcers which cannot be safely resected. It might also be used for late vomiting after gastroenterostomy due to closure of the stoma from porky inflammatory edema of the anastomosed stomach and jejunum, and mesocolon. We have observed this phenomenon once.

Technique (Fig XII) A loop of jejunum is selected at a suitable distance from the duodenojejunal flexure. A purse-string suture about a half inch in diameter is passed on the antimesenteric border of the bowel. The bowel is perforated within the suture and an 18 F catheter inserted for four to six inches. The purse-string suture is pulled tightly and tied. The catheter is laid longitudinally along the bowel wall proximal to the point of insertion, and the bowel wall approximated from each side over the catheter for about an inch. Two linen sutures are passed through the walls of the bowel over the catheter, and brought up on each side of the incision through all layers of the abdominal wall. After the peritoneum, fascia, and skin have been sutured in the usual way, the linen sutures are drawn tightly and tied, thus fixing the loop of bowel firmly to the abdominal wall, and preventing its slipping away from the catheter.

XIII Entero-Entero-Anastomosis

This operation was first introduced by Braun in 1892, who used it to unite the afferent and efferent loops of a long loop gastroenterostomy. It is also occasionally of value between the two loops of a short loop posterior gastro-enterostomy when the vomiting of a vicious circle appears. Although this complication has almost disappeared with the short loop anastomosis, yet it occasionally does develop. If due to the mechanical conditions of the anastomosis and not to inflammatory edema at the stoma, it may be corrected by enteroenterostomy.

Technique (Fig XIII) The site of the anastomosis is carefully examined to rule out inflammatory occlusion of the stoma, in which case a jejunostomy will best tide the patient over until the edema subsides and emptying will correct itself. The duodenojejunal loop proximal to the gastro-enterostomy (afferent), is approximated to the jejunal loop that drains away from the stomach (efferent). An anastomosis is made between these two loops as described under the anterior gastro-enterostomy. This will drain the gastric and duodenal secretions across into the distal loop thus preventing a vicious circling through the stomach and proximal loop. This is done when repeated lavage has failed to control the retention and while the condition of the patient is still sufficiently good to withstand a second operation.

CONCLUSION

Technical methods used in the surgical treatment of ulcer are highly standardized but the application of these methods to each ulcer must be made on an individual basis. The selection of the type of operation should be made when the ulcer is exposed at the operating table. The school of radical surgery advocates resection of the stomach for all benign ulcerations of the duodenum, with a general mortality rate of thirteen to fifteen per cent. The conservative school, to which most American surgeons adhere, advocates primary conservative surgical measures, to be followed by radical methods in the few cases that have unfavorable results. The mortality rate for conservative methods is probably half that of radical methods.

A study of 105 consecutive cases operated upon according to the precepts of the conservative school show that we employed the method of direct removal of the ulcer and subsequent pyloroplasty in eight per cent of the cases. Pyloroplasty was limited to small anterior wall juxtapyloric ulcers with a mobile duodenum that permitted of a plastic repair without tension. Posterior wall "kissing ulcers" with such anterior wall ulcers were destroyed by cautery. This procedure is ideal for bleeding ulcers when it is advisable technically.

Seventy-five per cent of the ulcers in this series were treated indirectly by gastro-enterostomy. This method leaves the ulcer in situ but induces healing by side-tracking a portion of the food stream. This shortens the emptying time of the stomach, and reduces the acidity of the gastric juice, factors shown by experimental studies of the author² to be significant in causing chronicity of ulcers. We performed gastro-enterostomy for unexcisable duodenal ulcers, after closure of some perforated ulcers, also as an additional procedure after excision or cauterization of gastric ulcers, and for unresectable ulcers high in the cardiac portion of the stomach.

For chronic bleeding duodenal ulcers in the presence of a patulous pylorus, the Devine resection by exclusion was used in two per cent of the series. By this method the same desirable

results which follow radical resection are attained and with less risk. We propose to use this operation for bleeding ulcers more extensively in the future.

Radical surgery was used for fifteen per cent of the cases. All gastric ulcers which did not heal on a medical régime were removed. Ulcers in the antrum of the stomach which could not be excised or destroyed by cautery were subjected to pylorotomy or partial gastrectomy. The two recurrent jejunal ulcers were treated, after resection of the jejunum, by pyloroplasty and a Roux en Y anastomosis respectively.

American clinics report eighty to ninety per cent satisfactory results after conservative surgical treatment of ulcers. The primary mortality rate is variable depending on many factors—climate, physical condition and nutritional state of the patient, and complications. The mortality rate reported by various surgeons is 25 per cent (Balfour⁶, Mayo Clinic), 75 per cent (Pool⁷, New York), 8 per cent, (Peck⁸, New York), 10.8 per cent (Gibbon⁹, Philadelphia), 15 per cent (Fordyce St. John¹⁰, New York). Our series was operated upon with a mortality of 77 per cent. The deaths were chiefly from pulmonary complications in the group of difficult gastroenterostomies.

This series, though small, illustrates the va-

riety of operative procedures a surgeon should use if he is to meet properly the problems presented in the field of surgical treatment of peptic ulcer. Conservative surgery properly applied, will bring relief to many chronic invalids who do not respond satisfactorily to medical management. This can be done with a mortality rate which will not exceed the death rate for an average group of inadequately treated ambulant patients who roam our streets harboring dangerous chronic ulcers.

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SOME PROBLEMS FREQUENTLY ENCOUNTERED IN THE TREATMENT OF RECENT FRACTURES*

BY H. EARLE CONWELL, M.D.†

THE necessity for improved fracture treatment has been demanded in the last few years by the increasing number of fractures and their disabilities resulting from industry, automobiles, aeroplanes, and other technological changes. Even though many safety first methods and precautions have been introduced to lower the incidence of accidents, we can never entirely eliminate them, due mainly to the element of human carelessness. The aim of treatment is to expedite a complete recovery of function, which is best attained when the procedures run in harmony with the natural processes, that is, with powers of resistance, growth and repair.

The proper procedures in the early history of fracture treatment and the immediate recognition of all local and general pathology are important. Immediate splinting of the part involved regardless of the certainty of a fracture should be done. "Splint them where injured," thereby preventing unnecessary local trauma and shock. The benefit of splinting a fracture before transportation is attempted was demon-

strated forcibly during the World War when the mortality rate was reduced in compound fractures of the femur from nearly eighty per cent to sixteen per cent after the adoption of this procedure. The splinting should be the simplest, most effective and most easily applied. Usually the simpler the splint the easier the application. In every case the joints which are proximal and distal to even the suspected fracture should be splinted.

The type of treatment depends on the individual case. Each fracture with its complications is a law unto itself, demanding individual common sense surgical judgment. The treatment should be adaptable to the fracture, the fracture must not be adapted to the treatment.

The writer does not believe that a standard method for the treatment of fractures in every case is possible. Not until every type of fracture can have the same bone and soft structure involvements, the same external force producing it, occurring in patients of the same age and having the same general physical and local conditions with the same resistance or recuperative power, can we hope to standardize the treatment of fractures. If this could be possible, treatment of fractures would cease to be a science and would not demand our own common sense judgment and expert opinion.

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Too frequently are superficial and careless physical examinations made, the results being that fractures are often overlooked. Certain cardinal physical signs are not always necessary to indicate a fracture. This is especially true in fractures of the spine where a patient may receive a slight or moderate fall on the buttocks, and afterwards suffer very little or no pain whatever in the spine, but when roentgenograms are taken a compressed fracture of one or more vertebrae is seen. A lateral roentgenogram of the spine when one suspects any bone involvement should always be made. We should always be suspicious of a fracture of the spine in even the slightest injury, directly or indirectly, to the back or buttocks.

In contrast to the above the case is presented which comes to the hospital unconscious as the result of a head injury, badly shocked, and showing every evidence of brain trauma. This patient should be treated symptomatically as a severe brain injury irrespective of bone findings. In cases of this type a roentgenogram frequently does not show a fracture of the skull. As a matter of fact roentgenograms in this type of case are not always immediately necessary for the proper treatment of the patient. Too often are patients with injury of such type moved to get roentgenograms, causing more damage than there is good derived from the knowledge obtained.

Roentgenograms, when possible, with anteroposterior and lateral views, should be made before attempting the reduction of a fracture. Following the reduction these same views as well as other roentgenograms at different intervals during convalescence should be made. These are not only necessary for checking up the position and union of the fracture, but as a protection and record for the doctor treating the case. When fluoroscopic examinations and reductions are done roentgenogram checks should also be made because fluoroscopic examinations cannot be recorded, such procedure, therefore, does no good before injuries. Fractures cannot be treated by roentgenograms alone. The reduction of a fracture constitutes only one of the important processes in its treatment.

Early reduction should be done providing local and general symptoms permit. With certain severe fractures about joints, especially the ankle joint, with a large amount of swelling but good anatomical position, care should be exercised about placing such injury in a circular cast too early with the possibility of cutting off circulation. Casts when applied should be cut along the whole course of application if there is any doubt whatever as to circulation. Of course, where the fragments are displaced they should be reduced as early as possible. If, however, when there is marked soft structure involvement and no fear of malposition developing some simple wire or board splint should be

applied with hot wet boric or saline dressings for twenty-four or forty-eight hours or longer (removing dressings every twelve or fourteen hours and inspecting them).

Relaxation during the reduction of a fracture is demanded. This relaxation can be accomplished by continued traction, massage, or spinal, local or general anesthesia, each one having its individual indications and advantages, however, no one method is to be used in every case.

Local anesthesia has taken a definitely indicated place with fracture work today but it must not be used indiscriminately. It is not a panacea by any means. Harm can result from its use even though the enthusiasts say they have never had any trouble. The author prefers a one per cent novocain solution for local injection. Objections to local anesthesia are the following:

(a) When injecting the anesthetic especially in fractures about the wrist joint, one gets a distortion of the landmarks, this, of course, is variable depending on the amount of anesthetic used.

(b) More pressure locally is brought about which prevents, to a certain extent, relaxation which would be conducive to manipulation and reduction.

(c) Theoretically, at least, the pressure from the injected local anesthetic impedes the blood supply.

(d) In certain cases the patient cannot be prevented from having some muscular rigidity.

(e) A latent spasticity of the muscles which seems to persist during convalescence more in the local anesthetic cases than when no local injections are used has been observed by the writers in several cases.

(f) The possibility of an infection, which would be a catastrophe but should not occur if proper technique is carried out.

The procedure of molding or kneading around fractures after injecting novocain or even when using general anesthesia in fracture reduction, especially about the ankle joint seems to the writer a very dangerous procedure, being conducive to the formation of emboli and thrombi. Why bring about further trauma to already traumatized tissue as well as forcing traumatized blood into surrounding normal structures? Deaths and complications have been reported from such procedures.

The majority of all fractures can be reduced by the closed manipulative method and immobilized by circular or bivalved plaster casts. When doing the closed reduction, care must be taken that no serious local trauma is caused. Repeated attempts at closed manipulative reductions are not necessary before making a decision as to whether the continuous traction or open reduction technique is to be carried out in an individual case. Such type of treatment

by the closed method is not a conservative but a radical method of fracture treatment

The writer believes that frequently more surgical judgment and care are demanded of the surgeon to be able to dextrously reduce a fracture by the closed procedure than by the open method. The surgeon who knows the anatomy, pathology and mechanics of the parts involved, the knowledge of which in the treatment of fractures is imperative, is able to do a closed reduction with minimum trauma. He is a more able surgeon than the one who cannot give such advantages, causing the patient to be subjected to unnecessary traumatizing closed reductions or open operative methods. Too tight bandages, splints or casts must never be applied. Frequent observation during the first few hours following the reduction of a fracture and every few days thereafter should be made. In any fracture living tissue is involved whether it be bones, muscles, ligaments, joints, nerves or blood vessels, any or all of which demand frequent attention, and without this observation undesirable results will usually occur. Fractures must not be tampered with too often, palpate only when necessary, but observe frequently.

The knowledge of the physiology of fracture repair and the surrounding soft structures is imperative. If we forget these we are not doctors treating fractures but mechanics, and will soon be in ill repute. Don't be like the physician who once asked me the following "Doctor, the treating of a fracture is nothing more than a simple mechanical problem, isn't it?" We must also treat the general condition as well as the local pathology. Not infrequently examinations will show the cause of a fracture to be a certain bone pathology indicating a local manifestation of some constitutional disease existing before the fracture occurred.

There is now a wave of enthusiasm regarding the ambulatory treatment of fractures. No one believes in earlier motion in the treatment of fractures than the writer, but the laws of Hunter and Hilton on rest and immobilization must not be forgotten. Too early weight-bearing frequently brings about excessive painful callous formation and in certain instances non-unions and permanent disabilities. In certain fractures about the ankle joint with very little bone involvement and no displacement or any possibility of a displacement of the fragments, early weight-bearing soon after injury may be allowed provided a plaster splint and walking iron have been properly applied, and when supervision can be carried out frequently under ideal and controlled conditions.

The writer has concluded that the patient in the majority of such instances fortunately will control the overenthusiastic doctor who forces too early weight-bearing of the ankle and leg fractures, because of the pain which he encoun-

ters when carrying out such early weight-bearing. The common laws of nature generally will cry out for help against the faddism which is too often practiced by some members of the medical profession.

Even though the majority of fractures can be treated by the closed reduction method with fixation in some form of plaster splints or casts, with as early motion as is permissible, it is the minority in number which cannot be treated with this method and which usually make the majority in trouble. This minority demands, in most cases, our best judgment and opinion and represents probably the greatest difference in the proper and improper ways of treating fractures, resulting in the difference between excellent and poor results.

Skeletal traction treatment, which has usually been classified in the past as conservative, appears to the writer to be rapidly becoming a radical treatment. Too frequently are its limitations and indications being abused. The medical profession should not become overenthusiastic regarding the skeletal traction methods and assume that a panacea has been found for the treatment of all fractures. The writer still advocates and practices the use of skeletal traction in selected cases which in his opinion are ideal, and when indicated, application should be carried out without hesitancy. Rarely, if ever, are these selected cases in children, due to possible epiphyseal injury.

Skeletal traction has saved many extremities when properly used. The method demands close observation and patience. In the majority of instances, if used when indicated, good results will be obtained. Indiscriminate application of foreign material through the medullary canal should not be practiced. I prefer the Kirschner wire in the majority of instances due to its small size and its ease of application.

There are many types of tongs, pins, and wires which are good. Some have one advantage, others another, none is ideal. Better results are probably obtained by learning the use of one tong or pin thoroughly than by constantly changing as new ones are devised. It is inadvisable to use tongs with long points. They are apt to pierce too far into the bone.

The advantages of skeletal traction are as follows:

It is the only traction whereby one can get maximum traction with minimum application of traction material applied.

Since skeletal traction is direct, therefore, much less weight is required to overcome shortening.

Traction is regular and continuous, which it must be to be effective.

Properly applied, the method is entirely painless, and the patient is comfortable throughout the entire course of treatment.

The lower fragment is at all times under excellent control and can readily be brought into line with the upper one

Since this leaves the rest of the limb entirely free, active and passive motions may be readily performed at the joints

Open operation can be avoided in a large majority of cases

Different types of physiotherapy treatments can be more easily applied

Some of the disadvantages of skeletal traction are (1) the possibility of infection, (2) the introduction of foreign material through the medullary canal, (3) overextension of fragments which may cause a delayed or non-union, and (4) a rotation of the distal fragment if alignment is not frequently watched.

Adhesive plaster is in common use as skin traction and works well within limitations. A good grade of moleskin adhesive is preferable to zinc oxide adhesive

Too prolonged traction should be guarded against because it brings about a varied period of temporary muscular paralysis which is difficult to overcome at times, and also, when using skeletal traction for too long a time infections are more liable to occur around or along the course of the wire or pin. As soon as alignment is restored and sufficient callus has formed and when some type of fixation can be applied, the skeletal or adhesive traction should be removed.

In certain selected cases where the economic status will not permit hospitalization it is not contraindicated to use a non-weight-bearing ambulatory plaster cast with skeletal traction and countertraction incorporated in the cast. Here again, however, this type of skeletal traction is not to be used indiscriminately, it is only indicated in a few cases, and such cases demand close observation. Excellent ambulatory traction and counter apparatus have been described by White, Carter and others

Open operative reductions when indicated should be done without hesitation. The indications, however, for open operative reductions before first trying to do the reduction by the closed or traction methods are few. It is not necessary to discuss the technique of different types of internal fixation except to say that as in all other methods of fracture treatment the surgeon should use that recognized standard method with which he is most familiar, and if not familiar with such methods proper consultants should be obtained

When delayed union is present be slow to call it non-union, because if surgical interference is carried out too soon in such types of cases the surgeon may be defeating the whole purpose and progress toward union. Frequently patience on the surgeon's part will be re-

warded by union taking place. Generally speaking a delayed union is not a non-union until five or six months from the date of injury

Too early weight-bearing after removal of all fixation, especially in fractures of the ankle or knee joint should be guarded against. Frequently fractures of the knee joint during early convalescence do not show any instability but, if walking is allowed too soon without a support, become unstable. The same is true of ankle fractures

Physical therapy is essential in all fractures, not necessarily and entirely machine therapy, such as diathermy, but the use of the simple physical resources such as hot water and ordinary heat and lights

Too prolonged fixation is a very disabling procedure. It is not conducive for early function. Early active motion used by the patient is one of the most important procedures in accomplishing good functional results. Hot and cold contrast baths are to be used when sufficient callus formation has taken place to allow the temporary removal of any fixation from the involved part. Massage and other forms of physiotherapy when accessible are of great help. All of these procedures should be under the direct supervision of the doctor treating the case, and when possible in cooperation with a capable physiotherapist of the medical profession.

In fractures with skeletal traction or a Thomas splint some form of radiant heat is useful, and the patient can often be instructed to give himself some superficial massage. The cooperation of nursing in physical therapy is essential. In hospitals where there are physiotherapy departments, the patient often gets the impression that all he must do to obtain function is to visit this department once daily. This, of course, is a tragic development

The splinting in physiotherapy is too frequently overlooked. In a stiff shoulder with a weak deltoid and contracted pectoralis major, no physical therapy will produce function by an hour's treatment if the arm is allowed to hang for twenty-three hours instead of being in an aeroplane splint

One of the most important physical agents to use in fractures is exercise. The muscles of the body are expected to work together in the co-ordinative movements which we use in our daily ordinary work and they will work together longer when there is a purposeful nature in the exercise. Therefore, curative occupational therapy is probably the best exercise and is of the greatest value. Even without expert directions the surgeon can with a little ingenuity use occupational therapy

One's ability as a surgeon in treating fractures is not determined entirely by the method or methods of treatment which he uses but by the functional results obtained. The surgeon

behind the treatment is most important. Frequent observations during the convalescent period of a fracture are essential. The surgeon who reduced the fracture should realize that it is not beneath his dignity and responsibility to remove a cast or splint during convalescence and inspect an injured limb, and to reapply the splint, giving his opinion for future treatments. Good surgical judgment is just as necessary during the convalescence of a fracture as at the time of the reduction.

Ultimate results to be attained and hoped for in any fracture are union, alignment and function. When all other factors are equal, perfect bone approximation is usually conducive to early union and restoration of function. However, the possibility of obtaining good functional results when good alignment is present should never be sacrificed merely to obtain perfect bone approximation, because a return to normal func-

tion is not always dependent on perfect bone reapposition. This is mainly true in shaft fractures but usually not so in joint fractures where it is best to get as good anatomical position as possible to obtain good function. Finally, function is not only dependent upon union and alignment but also upon full cooperation and determination of the patient to aid himself during convalescence.

The psychologic aspect of the patient with a fracture is an individual problem. A thorough understanding by the patient as to his condition should be explained by the physician, and the patient assured that he will have an excellent chance to recover normal functions if such is at all possible. Due consideration should be given to the compensation case who generally has a longer disability than the corresponding injury in another patient. Confidence of the patient in the physician is essential.

CHANGE IN THE MASSACHUSETTS CANCER TREND*

BY GEORGE H. BIGELOW, M.D.,† AND HERBERT L. LOMBARD, M.D.†

IN a paper published in 1926¹ the committee studying the cancer situation in Massachusetts suggested that on the basis of the break in the trends in certain age specific groups the saturation point was not far distant. Schereschewsky², in 1925, suggested that cancer would be subject to the general law that physical, chemical and biological processes all tend to a state of equilibrium and that, as a result, its saturation point might be expected. The record of ten additional years has now been obtained with the result that the break in the trends is even more apparent. In all of the female age groups the trend is changing, and in those under seventy an actual downward tendency is noted. Among the males the change is present, although not marked. The break in the trends began at different periods in different age groups, and as similar phenomena have been noted in other diseases, it has been inferred that cancer might have a biologic rise and fall.

In addition, however, to what may be occurring in the disease itself, there has been during the past few years a concerted drive toward the control of cancer. The American Society for the Control of Cancer began its activities in 1913 and the Massachusetts Cancer Program was inaugurated in 1926.

In an attempt to determine the factors behind the changing trend, a study was made of the cancer death records in Massachusetts from 1900 to 1932 and of additional data obtained from the records of the Massachusetts State aided cancer clinics and cancer hospital.

Rates adjusted to age for males and females have been computed for individual years from 1900 to 1932 (table I). As a pronounced break in the trend in females occurred in 1916 trends prior and subsequent to this date have been obtained for both sexes. The trend for the males from 1900 to 1915 was +1.65, while from 1916 to 1932 it was +1.35. There is a slight but not marked, lowering of the trend in the second period. Among females the two respective trends were +1.93 and +0.17. The drop in the female trend is significant and indicates some factors at work in this sex which are not present in the males.

The improvement among females is most apparent in the age groups under sixty. Between 1920 and 1930 the native born show a stationary trend among females, while the foreign-born show a downward trend. Among the males the trend is upward but is less among the foreign-born than the native born.

When the deaths are subdivided by location of cancer, among the males significant downward trends are noted only in cancer of the skin. Among the females, digestive tract cancer and cancer of the skin have significant decreases. In the nativity groups the only significant decrease is in digestive tract cancer among the foreign-born females. Breast cancer has a significant upward trend in the total group, but in the nativity groups is significant only in the native born of foreign and mixed parents. Although the trends of certain individual nativity groups are not significant the inference appears that skin cancer of both sexes is declining, that digestive tract cancer among the females is declining, that female genital cancer is about stationary, and that cancer of the breast is slightly increasing. A large part of the

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improvement seems to lie among the foreign-born

An increase in digestive tract cancer among males and a decrease in the same type among females does not seem reasonable. The International List of Causes of Death classifies the location of cancer by its place of origin. If the attending physicians are reporting today cancers by place of origin, while in previous years they reported similar cases by place of metastases, we would expect to find less improvement in breast and uterine cancer than actually occurs. It is reasonable to assume that such a change has occurred and that part of the seeming decrease in digestive tract cancer is apparent rather than real and the rates for breast and female genital cancers are less than the figures indicate.

While we have no authentic figures to prove that such is the case, we know that at the present time many physicians are still reporting by organ of metastases. A study of 600 cancer records where the diagnosis was established at the Pondville State cancer hospital and where death occurred elsewhere showed radical changes in the organ affected. Of 149 cases certified on the death record as being due to cancer of the digestive tract, ten at Pondville had originally been diagnosed as cancer of the uterus, seven cancer of the breast, sixteen cancers of other sites and twelve non-cancer. While it is admitted that the Pondville diagnosis may at times be in error the fact is established that at the present time breast and uterus cases are being classified as cancers of the digestive tract. It is believed that this was done to a far greater extent in 1920 than at present.

Inasmuch as the greatest changes are appearing among the foreign-born, this group has been studied in detail. In a paper on Cancer Mortality in Nativity Groups³, it was shown that the foreign-born and their children had higher rates for cancer than the native-born of native parents. The differences were particularly marked in cancers of the mouth and digestive tract.

The average age at time of death of the foreign born with cancer was 63.6 years and of the native born of native parents 68.3. A part of this difference may be due to the differences in the location of cancers but the major part is assumed on the basis of our findings in other chronic diseases⁴ to be due to earlier age of attack.

The duration of cancer among the foreign-born is shorter than is that of the native-born. A higher mortality, an earlier age of incidence, and a shorter duration might indicate either a greater virulence of the disease or less resistance among the foreign born. This seems probable as the cancer clinic records show that the duration of symptoms prior to visit to the

clinic is about the same among the foreign and native females and slightly less among the foreign males than the native males, but that the percentage complaining of pain when arriving at the clinic is greater among both sexes of the foreign-born than the native-born. As pain is usually a late symptom of cancer, it would seem reasonable to assume that when the foreign-born arrived at the clinics the disease had progressed more rapidly than it had among the native born.

Six months after admission to the clinics, twenty per cent of the foreign-born and only fourteen per cent of the native-born with four native grandparents were dead. At the end of eighteen months the figures were about 37 per cent and about 27 per cent respectively. The question arises "Do the foreign-born receive as adequate treatment as the native born?" Many of them attend the clinics in large hospitals where they are under the supervision of some of the best men of the profession.

Massachusetts is composed of 25 per cent foreign-born population but the proportion of attendance in the State-aided cancer clinics is nearly 40 per cent foreign-born.

The percentage of the foreign-born who die with cancer having had a previous operation is slightly less than that of the native-born but the number of unknowns is large and could easily alter the figures. On the basis of the death records the foreign-born receive operations for breast and female genital cancer slightly earlier than the native-born. It would be hard to say from the data that the type of treatment received by the foreign-born was any less adequate than that received by the native-born.

It would seem that the change in the cancer trend is due to one or more of the following:

1. Cancer is reaching a saturation point in our population.
2. The concerted drive against the disease is lowering the trend.
3. The improvement is apparent rather than real, due to changes in diagnosis.
4. The changing composition of the population is altering the rate with no change in the disease itself.
5. Changing living habits may be contributing to the situation.

There are arguments for all five of these premises. If a saturation point is being reached, we might expect the change to be first noted in the groups having the highest rates. We find this. The changing of the trends at different intervals in different age sex groups would also point in this direction. Moreover the first break in the trend occurred prior to the intensive work in cancer control.

The results from the concerted drive against

cancer might be accomplished by cures, by prevention through the removal of precancerous lesions, and by the prolongation of life in individuals not amenable to cure. If an increase in the number of cures can be attributed to the cancer campaign in this State, the effect would be felt in the death rate about two years later, the lapse being due to the average duration of cancer. The removal of precancerous lesions might be felt at any time after this two-year interval. It is impossible to judge, of course, which of these lesions if left alone will eventually become cancers or at what period. It is extremely doubtful if many of the precancers are at the point of developing cancer when treated, and such effect on the death rate would, therefore, be largely at a later period. Both an increase in the number of cures and removal of precancerous conditions would permanently lower the cancer rate. Methods used to prolong life but not to cure would have a tendency, at first, to lower the cancer rate, but would later contribute to a rise.

The results of programs for cancer control would be expected among the more accessible cancers. The greatest improvement is appearing among females who have more accessible cancers than males. The downward trend in middle-aged females points toward improvement in breast and uterine cancer, and if we assume that a part of the digestive tract cancer has been wrongly classified, the result would indicate that the rates for breast and uterine cancer have been lowered. Five years after the inauguration of the Massachusetts Cancer Program, the general hospitals in Massachusetts were admitting 34 per cent more cancer than before, while in parts of the United States where such programs had not been so intense, the increase was 21 per cent. The concerted drive against cancer has improved the type of treatment the patients receive. In the five-year interval there was a sixteen per cent decrease in cancer patients dying following operation in hospitals, and a 22 per cent decrease in patients dying following radiation in hospitals.

The number of patients attending the Massachusetts state-aided cancer clinics is increasing. In 1932 the total attendance was 254 per cent greater than in 1927, the number of individuals with cancer was 260 per cent greater, and the number with precancerous lesions was 344 per cent greater—the actual figures for 1932 being 3,427 total attendance, 793 with cancer, 303 with precancerous lesions. The median delay between first symptoms and visit to clinic has also decreased slightly for cancers of all locations, and over 30 per cent in breast and buccal cavity cancers.

While it is reasonable to assume that a part of the increase in cancer might be due to better diagnosis, it is more difficult to believe that a decrease could be accounted for by the same reasoning. Wells⁶ reports an autopsy series in

which he found 178 cases of cancer not so diagnosed and only thirty-three cases diagnosed cancer that were not cancer. Riechelmann⁶ reported 711 cases, 156 not being recognized as cancer and only fifty-eight cases diagnosed as cancer with the disease not present. This would indicate that improved diagnosis would tend to augment, rather than depress, cancer rates. It may be utopianly argued that the increase has stopped by arriving at the maximum of diagnosis perfection, but still this does not account for a decrease. It would hardly be seriously advanced, we think, that the general accuracy of diagnosis throughout the State was deteriorating.

How important are mixed nativities in the changing cancer trend? The native-born of native parents are not an entity in themselves. The census does not furnish information as to the composition of their grandparents. Some of this group have American forebears since early colonial days, while others are the grandchildren of immigrants. We know that the children of the foreign-born have higher cancer rates than those of native-born parents and even than the foreign-born themselves.⁸ We do not know whether this is carried on to successive generations. The foreign-born ranks are becoming more and more complex and it is reasonable to assume that the native-born of native parents of 1930 may differ considerably from this group at earlier periods. The composition of the foreign-born can be ascertained with a fair degree of reliability. Between 1920 and 1930 the proportion of Irish among the foreign-born has decreased from 17 per cent to 15 per cent, while the Italians have increased from 10.8 per cent to 12 per cent. The proportion of individuals born in Russia-Poland has decreased from 15.5 per cent to 13.3 per cent, while those born in Canada have increased from 24.2 per cent to 27.2 per cent. These four nativity groups comprise two-thirds of the foreign-born population in Massachusetts. The cancer rate among the Irish is high, among the Italians, low.³ The Canadians and Russian-Polish group have moderately high rates. The change in the composition of these four races might alone decrease the cancer rate in the total foreign born group.

The extent to which environmental factors contribute to cancer is problematic. Various types of irritation have been shown to be associated with the disease. Others have been postulated. There are probably countless irritations connected with diet, exercise, and other forms of daily behavior. These may predispose to cancer or they may not. Again, there have been profound industrial changes. With the practical disappearance of carpets, tacks no longer irritate under the tongues of those who used to lay them. There are many other changes that are more subtle. While largely theoretical, it is well known that there have been great

changes in the living habits of the people in recent years which might affect cancer predisposition. Individuals today are far more vitamin-conscious than they were a few years ago. Green

TABLE I

MASSACHUSETTS AGE, SEX ADJUSTED CANCER DEATH RATES

Adjusted to Massachusetts 1900 Population
Rate per 100,000

Year	Male	Female	Total
1900	50.2	91.6	71.5
1901	50.6	93.7	72.7
1902	47.9	97.0	73.0
1903	50.9	97.8	75.0
1904	54.2	102.9	79.2
1905	55.5	103.7	80.3
1906	63.1	99.5	81.8
1907	58.9	108.7	84.4
1908	59.9	108.7	84.9
1909	60.3	108.5	85.0
1910	63.7	111.3	88.1
1911	68.8	112.1	91.0
1912	63.5	117.6	91.3
1913	71.5	119.7	96.2
1914	70.9	119.6	95.9
1915	73.7	119.5	97.2
1916	77.1	126.5	102.5
1917	76.2	127.0	102.3
1918	78.6	123.2	101.5
1919	77.9	120.5	99.7
1920	84.5	128.6	107.1
1921	85.9	129.4	108.2
1922	83.5	126.9	105.8
1923	85.4	125.8	106.1
1924	92.2	127.5	110.3
1925	89.6	130.0	110.4
1926	94.3	127.5	111.4
1927	92.5	128.9	111.1
1928	94.3	128.8	112.0
1929	93.3	127.4	110.8
1930	96.8	125.4	111.5
1931	93.6	126.2	110.3
1932	97.1	129.1	113.5

vegetables are considered an all-year diet instead of a seasonal one. Greater attention has been given to personal hygiene. Clothing is more sanitary. On the other hand, the strain

and stress of present-day life is more exacting than it was a generation back. How much this may have to do with the cancer problem cannot be answered, but it must be given consideration.

The evaluation of these five possibilities leads us to believe that diagnosis is of least importance, that health habits should be considered but as yet there is little to warrant a belief in their importance in this matter, and that the other factors (more adequate and earlier treatment, changes in racial stock, and a saturation point in cancer being reached in our population) may have about equal weight.

CONCLUSIONS

The trend of cancer mortality in Massachusetts is changing with the curve flattening out and a slight decrease noted among females. The rate for the foreign-born females is decreasing faster than for the other groups. While the death rates indicate that cancer of the digestive tract in females has the greatest improvement, it is believed that erroneous classification in the earlier years is responsible and that the decrease is really in breast and uterine cancer. It is our opinion that the improvement in the cancer death rate is caused by the concerted drive against cancer, by changes in the composition of the foreign population, and by the possibility of a saturation point in cancer being reached.

The relative significance of each of these factors must be determined in the future, if at all.

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PERICARDIAL HEMORRHAGE COMPLICATING SCURVY*

A Case Report

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SCURVY, Scorbutus, or Moeller-Barlow's Disease is due to the deficiency of a specific water-soluble vitamin, called "C." The history, etiology, clinical course, and pathological findings of this condition are too well-known

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to bear detailed repetition here. This information is readily accessible in any of the standard textbooks on the subject. In brief, the disease is generally divided into two major types, the infantile and adult, depending upon the age of the patient. The two groups are similar except that the bone changes in the infantile group are much more profound than in the adult. The outstanding symptoms and signs are irregular

fever, weakness, and malaise, ecchymosis of the skin, swollen, spongy, and bleeding gums, subcutaneous, submucous, intramuscular, and subperiosteal hemorrhages of a greater or less magnitude Bierich¹ tabulated the postmortem findings of the largest group of cases (over 1300) Erdheim² also reported the findings in a large series of cases that he personally examined

Both Bierich and Erdheim emphasized the consistency of the hemorrhagic findings In rare instances they found intrapleural or intra-abdominal hemorrhages Bierich considered the bleeding due to an exogenous injury of the vessel wall after the wall was endogenously changed by the lack of the specific vitamin Wolbach³ felt that this endogenous change is brought about by the lack of, or change in the intercellular cement substance Erdheim emphasized the importance of right cardiac hypertrophy, a finding that he obtained in over 67 per cent of his cases both in the infantile and adult types

In a careful review of the literature as far back as 1910 no reference was found to an intrapericardial hemorrhage It was on this account that the following case was considered to be of sufficient interest to warrant publication

CASE RECORD T V, hospital number 33776 a forty four year old white male was admitted to the Worcester State Hospital in 1917 and was subsequently given the psychiatric diagnosis of schizophrenia He had definite hallucinations and delusions with frequent catatonic episodes One of his frequent delusions was to the effect that food would injure and possibly kill him On this account he frequently refused to eat The remainder of the psychiatric data were irrelevant to the thesis on hand

On May 29, 1931 (then 58 years of age) he was transferred to the Medical Service from a psychiatric ward, presenting hemorrhages from the gums and purpuric spots of the lower extremities A careful checkup revealed the fact that this patient would when left to his own choice, eat only meats and a very small amount of boiled potato

Physical examination revealed a well developed and well nourished adult male The essential findings were swollen and spongy gums that bled easily The teeth were demarcated from the gum margins by blackened, necrotic areas There were many purplish patches scattered over the buccal mucous membrane The tonsils were buried and covered with grayish white follicular spots There was a slight infection of the anterior pillars and posterior pharynx The sublingual ducts and glands were red dened and swollen On the right side of the neck there was one small, firm anterior cervical gland the size of a marble Moist crackling râles were found in the apices of both lungs The skin was coarse and thickened with many dark chocolate brown macular areas over the lower extremities abdomen and back in many places becoming confluent and not fading on pressure Pitting edema extended upwards to the mid tibial regions in both legs The pupils were sluggish in reaction to light and slightly irregular There was a hordeolum of the right eye and a whitish discharge from the lateral commissure of the left eye The heart findings were essentially normal The blood pressure was 130/80 with a moderate beading of peripheral vessels The abdomen was normal The temperature was 99.8°F, pulse 80, and respirations 20

Laboratory studies revealed the urine to contain a minute trace of albumen with finely and coarsely granular casts A "Mosenthal" kidney function test showed a fixation in specific gravity between 1.008 and 1.012, with a total urine output of 618 cc., of which the night component was 250 cc, with a specific gravity of 1.012 The blood analysis revealed a NPN of 44, Urea 30 Uric Acid 3.9, Creatinine 1.4, and Sugar 87 mgm per 100 cc of blood Erythrocytes were 3,790,000, with anisocytocromia moderate, leucocytes 6,550, hemoglobin 80 per cent neutrophils 72 per cent and lymphocytes 28 per cent The bleeding time was 1½ minute clotting time three minutes The platelet count was 268,000 per cubic mm of blood. A provisional diagnosis was made of scurvy with generalized arteriosclerosis and chronic nephritis with edema Accordingly the patient was placed upon a special diet which included an abundance of fresh vegetables and orange juice daily At the end of a week there was little change and the edema had extended to the knees In another week the purpuric spots on the legs began to recede and the bleeding of the gums improved The blood findings were essentially the same as before X-ray examinations of the long bones revealed a general periosteal thickening with a little roughening

Much difficulty was encountered because of the patient's poor cooperation in all kinds of therapy Four days later he developed urinary retention and was catheterized Rectal examination revealed a firm, hard, smooth, symmetrically enlarged prostate During the next eight days he was catheterized daily and the residual urine gradually decreased. The general condition was markedly improved and the purpuric spots and edema had entirely disappeared At this time the red count was 4,260,000 per cu mm On June 27 he was discharged back to the psychiatric wards as recovered On October 5 (over four months later) he was readmitted with symptoms of faintness cyanosis of the face, repeated coughing nausea and vomiting Examination revealed the gums, mouth, and throat to be in the same condition as previously recorded His breath was cadaverous and lips cyanotic This time the heart was noted to be moderately enlarged, one cm outside the nipple line The heart tones were only fair in quality and a soft, blowing nontransmitted, presystolic murmur heard best at the tricuspid area was noted The pulse pressure was of low tension and compressible The blood pressure was 102/80 The liver edge was smooth slightly tender and three finger-breadths below the costal margin There were numerous small purpuric spots over the legs and trunk and a brownish pigmented area over the lower abdomen and another on the left ankle which appeared indurated The temperature was 101.2°, pulse 88, and respirations 20 per minute The urine was as before The red blood count was 5,160,000, leucocytes 15,000 the remainder of the blood morphology was as before

The patient vomited a small quantity of greenish fluid and did so again the next day He became restless and refused to eat. It became necessary to feed him daily by nasal tube, a quart of egg nog and the juice of two oranges or its equivalent in tomato juice There were no urinary disturbances at this time

On October 11 his color suddenly became poor and respirations shallow He was dyspneic and groaned but could not localize his difficulty The temperature was 103.6° pulse 120 and respirations 20 The heart sounds became increasingly weaker but regular and the pulse remained steady The chest findings were otherwise normal The patient expired suddenly within two hours

Postmortem Examination The autopsy was performed 19 hours after death. The patient undoubtedly died of a pericardial hemorrhage; the pericardium containing 28 ounces of fluid and clotted blood. The epicardium was covered on all surfaces by many short coarse, hemorrhagic easily friable fibrinous adhesions. Microscopical study showed organizing, hemorrhagic, fibrinous adhesions attached to the epicardium. A careful examination of the heart did not elicit any point of bleeding even after making thin, cross section slices of the entire organ. The heart weighed 420 Gm. and measured $14.5 \times 12 \times 5.5$ cm. thick. In addition to swollen spongy and bleeding gums there was blood around the larger vessels of the subcutaneous tissues, submucosa of the gastro-intestinal tract and subperiosteum of the ends of both femurs. The medullary portion of the left adrenal was hemorrhagic and the central portions of the femoral bone marrows markedly congested. The vessels of all of the viscera were likewise injected. The remainder of the findings were insignificant.

DISCUSSION One might be led to suppose that the epicardial hemorrhage occurred as a result of a general oozing from the walls of the coronary vessels particularly those nearer the surface but this bleeding is more apt to be from epicardial and pericardial vessels rather than from the coronaries.

The first question arises whether this was a case of scurvy. The most cogent argument is the fact that the patient recovered from the first attack after foods high in antiscorbutic vitamin content were forced. Due to the patient's mental condition and peculiar diet, when left to his own resources the onset of scurvy was ever a possibility. The ecchymosis, gum bleeding, irregular fever and malaise are consistent with scurvy as are also the postmortem findings of bone marrow congestion, subperiosteal hemorrhages, hemorrhages about the vessels of the subcutaneous and submucous tissues, and congestion of the organs. All of the post-

mortem findings fit in better with scurvy than with any other diagnosis.

SUMMARY A case is presented of a fifty-eight year old white male schizophrenic patient who developed symptoms and signs associated with those found in scurvy or vitamin C deficiency. On a diet high in vitamin C the patient soon recovered, but due to his mental condition, when left to his own resources he again rapidly showed signs and symptoms identical with those of the first attack.

He died suddenly during the second attack of a massive intrapericardial hemorrhage which apparently came from a general oozing of the entire epicardium. With it were other findings usually accompanying the results of this deficiency disease namely, irregular fever, malaise, bleeding from the gums, ecchymosis of the subcutaneous and submucous tissues, subperiosteal hemorrhages, and femoral bone marrow congestion.

CONCLUSIONS This case emphasizes the necessity for careful watching of the diets of all mental patients in order to prevent the onset of any deficiency diseases. The cafeteria system of handling food which is rapidly coming into vogue in most mental hospitals and which permits the patient a greater choice of foods than was heretofore possible has the danger of developing bad dietary habits and increasing the incidence of deficiency diseases. Therefore, steps should be taken to correct this fault.

Intrapericardial hemorrhage may in extremely rare instances, complicate scurvy.

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MEDICAL PROGRESS

PROGRESS IN HEMATOLOGY (1929-1933)*

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PROGRESS in hematology in the past five years has been astounding. Not since the days when Ehrlich first applied the techniques of the aniline-dye industry to the staining of blood cells has there been such intensive and extensive investigation of the disorders affecting the blood-forming organs. This has been due, in part at least, to the epoch-making discovery of Minkot and Murphy, reported in 1926, that liver would cure a hitherto always fatal disease, pernicious anemia. Until this significant mile-

stone "blood" diseases were considered almost universally fatal and to the average physician, of but little more than academic interest. Pernicious anemia began to be studied with feverish interest, and from these studies came many useful by-products.

Until fairly recently, there was no general recognition that the so called "diseases of the blood" were in reality diseases of the blood-forming organs. The blood cells, after all, do not inhabit the blood, but come into it from widely-scattered centers of active, cellular growth. Many factors influence these centers. Thus, who could have foretold ten years ago the striking relationship between the bone-marrow

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and the stomach which Castle so beautifully demonstrated in 1929? There are but few diseases which fail to influence in some measure the blood-forming organs. By observation of the peripheral blood it has thus become possible not only to gain insight into the workings of various infectious processes, but to deduce what is happening at a given moment in the bone-marrow or the lymphoid tissue. In other words, emphasis has shifted from a purely morphological "peripheral" study of the blood cells to a comprehension of the underlying physiological and pathological principles. With this shifting of emphasis has come a shift in the geographical center of hematological study from Europe to this country. American investigators, by adapting physiological principles to the "blood" diseases have made such striking advances in their therapy that the center for hematology has been completely taken from Europe to this country.

SURVEY OF THE LITERATURE

I THE BLOOD-FORMING ORGANS

The cells which circulate in the blood arise from three widely-scattered centers of active cellular growth which have come to be called "organs." These are the bone-marrow, the lymphoid tissue, and the reticulo endothelial system.

A The Bone-Marrow The article of Florence R. Sabin written in 1928 is a classic and repays careful reading. Active red marrow is scattered throughout the flat bones, and in the vertebrae and the epiphyseal ends of the long bones. Here all of the red blood cells, all of the blood platelets, and about 70 per cent of the white blood cells are formed. There is a growing interest in the study of this important organ as a means for the better understanding of blood pictures. Pathologists, content in the past to note the gross appearance of the marrow at the head of the femur, have turned their attention to the microscopic study of marrow tissue. Custer¹ has done a great service in standardizing bone marrow findings from autopsy observations. Much more is to be learned, however, from sections of the marrow removed at biopsy. Impetus to this study was given by Seyfarth (1923) who devised a trephine for removal of marrow from the easily accessible sternum. Since then several studies have appeared and various modifications of this trephine have been made (Arinkin, Arjeff, Tuschinsky and Kotlarenko, Custer², Dameshek¹).

Correlation of the findings in the bone-marrow with those in the peripheral blood has resulted in greater knowledge regarding the underlying pathological physiology of pernicious anemia (Tempka and Braun) and primary hypochromic anemia (Dameshek²) and has resulted in greater diagnostic acumen with regard to obscure blood pictures due to aleukemic leukemia (Dameshek).

B The Lymphoid Tissue Lymphocytes are formed in various lymphoid structures the lymph-nodes, spleen, tonsils, Peyer's patches of the intestine. They are derived from lymphoblasts which are in turn probably derived from even more primitive cells in the germinal centers of the lymph-nodes (histiocytes?—reticulo-endothelial cells). It is possible that both in the spleen and lymph-nodes, two distinct lines of cells are developed lymphocytes and monocytes, both arising originally from the primitive mesenchymal cell the histiocyte.

C The Reticulo-Endothelial System No field in hematology has commanded greater attention in recent years than that of the reticulo endothelial system. Until recently, much controversy took place regarding even the acceptance of such a "system." However, in the last few years, so much evidence has accumulated regarding the histology, physiology, chemistry, pathology, and reactions of this group of cells that but few remain to combat the concepts so well enunciated by Aschoff and Kiyono.

The reticulo-endothelial "system" is the sum total of a large number of cells which are gathered principally in the spleen, lymph-nodes, liver and bone-marrow, but are also present in the omentum, the skin, etc. The reticular cells of the spleen, the reticular cells of the lymph-nodes, the Kupffer or stellate cells lining the endothelial spaces of the liver, and the reticular cells of the bone marrow are all constituent parts of this system (Aschoff and Kiyono, Maximow, Schittenhelm, Krumbhaar, Bloom, also see Dameshek^{1, 2}). These reticulo-endothelial cells are large, of irregular shape (usually spindle shaped), the nucleus is spongy and "basket shaped." They are actively phagocytic and rapidly engulf injected particles (neutral red carbon, thorium dioxide) (Radt), they produce bile (bilirubin) from broken down red blood cells (Haldeman), they store fat (cholesterol, kersin) (Epstein), they are actively concerned in foreign-body reactions and tend to form giant cells, they are probably concerned in certain immunological processes (Schittenhelm), they produce the third type of white blood cell the monocyte (quoted by Dameshek²). They are probably the direct representatives in the adult human of the primitive mesenchyme (Maximow).

II THE BLOOD CELLS

A. Derivation Some note should be made in this review of the present status of the derivation of the blood cells. (For good discussion see Piney and Maximow, also Doan.) There can be no question that the blood cells in general are neither epithelial nor entodermal structures, but are mesenchymal in origin. The unitarian or monophyletic school maintains that the primitive mesenchymal cell, the hemohistioblast, the histiocyte, still functions in the adult to produce all types of blood cells. The dualists claim

that the primitive stem-cell is lacking but that there is (1) a bone-marrow or myeloid stem producing the red cells, the platelets, the granulocytes, and the monocytes and (2) a lymphoid stem producing lymphocytes. This view is held chiefly by Naegeli and finds but few other supporters. The trialists claim that only the secondary stems are present in the adult myeloid, lymphoid, and reticulo-endothelial. There is but little actual difference between the monophyletic and trialistic schools, but it seems to the reviewer that the trialistic view, originally championed by Schilling, is at present in the ascendancy. According to this view, the monocyte is derived directly from the system of histiocytes, the reticulo-endothelial system, and is distinct from either the myeloid or the lymphoid cells. The evidence for this view is cited by Dameshek.

B Terminology The terminology for the description of the red blood cells and blood platelets remains but little affected. The white blood cells, however, have suffered some changes in terminology. In the interest of simplification and the avoidance of controversial terms, the word *monocyte* has come into general use and the terms "large mononuclear cell," "transitional cell," and "endothelial leukocyte" have been in great part discarded in hematological literature (see description of monocyte). The term "large mononuclear cell" comprised both the large lymphocyte and monocyte and has been productive of much confusion. The concept of Ehrlich that the monocyte represents a transition between a myeloid and a lymphoid cell has been proved incorrect. Mallory's term "endothelial leukocyte" presupposes derivation of the monocyte from endothelial surfaces, this view does not hold general acceptance.

The popularization of the Schilling index (qv) has introduced several new terms into English hematological literature. The simplest translations for the German words "bandform," "stabkernigform" and "jugendform" are "band form," "staff form" and "young form." Schilling's book on the "blood picture" was literally translated into not very idiomatic English by Gradwohl and the latter author is to be credited with the introduction of such terms as "stab cell" and "juvenile cell" (band form and young form of polymorphonuclear). Modifications of Schilling's hemogram in this country are given below.

C The Schilling Index and Hemogram Arneith devised a classification or index of the maturity of the polymorphonuclear cells based upon the number and shape of the nuclear lobes. Although this index was undoubtedly useful in the determination of the degree of severity of an infectious state, it proved too cumbersome for general use and was gradually discarded.

Schilling began writing of his simplified index of the types of polymorphonuclear cells in 1911. By 1925, his method for making differential counts of the white blood cells was in general use in Germany and in most continental countries. It is only in the last few years that the method has come into fairly wide use in this country. (See Piney for good discussion.)

In order to understand this index, it is necessary to study the maturation of the polymorphonuclear cells in the bone-marrow. The most primitive polymorphonuclear cell, the myeloblast, need not concern us here. The *myelocyte* is characterized by a round nucleus and many coarse granules scattered over the nucleus and cytoplasm. As this cell matures, there is at first slight indentation of the nucleus, the *young form* of metamyelocyte, to be followed by more marked indentation, the *band form* of metamyelocyte. The nuclei of both the young and band forms are characterized by smooth outlines. The nucleus of the band form gradually becomes concentrated into lobes, the mature polymorphonuclear cell. These types of polymorphonuclear cells may be conceived as occupying layers in the bone-marrow. Farthest away from the circulation are the myelocytes, nearest are the mature polymorphonuclear cells. By the natural expansion of the growth process, the mature polymorphonuclear cells are pushed into or by amoeboid activity get into the circulation. Most infectious processes are accompanied by a need for polymorphonuclear cells. The stock of mature polymorphonuclear cells is quickly exhausted, and (as in war), younger cells are drafted. First come the band forms, then the young forms, finally myelocytes and possibly even myeloblasts. By observing the peripheral blood during an infectious process, one can gauge the severity of an infection and frequently its outlook. The differential count by this method (Schilling hemogram), is made by counting 100-200 white blood cells (preferably the latter number). Each cell is classified as in the ordinary differential count, except that the polymorphonuclear cells are divided into the types outlined above. The total polymorphonuclear count as well as the percentages of the various types of polymorphonuclear cells are recorded in some such form as this:

Polymorphs	Eosinophiles	Basophiles
Mature		
Band		
Young		
Myelocytes		
Lymphocytes		
Monocytes		

A "shift to the left" (toward the more "radical" or "young" form of polymorphonuclear cell), is seen when there is an increase in band

and young forms over normal and is an accompaniment of all infectious states even when leukopenia is present. Normally, less than four per cent of band forms are present. A mild infection brings about an increase of band and young forms (immature polymorphonuclear cells), to 15-20 per cent, a moderately severe infection to 20-40 per cent and a severe infectious state (septicemia, etc.) to 40-80 per cent. With subsidence of active infection, the following changes successively take place: (1) the appearance of an eosinophile or two, (2) a diminution in band forms, (3) an increase in monocytes, often to 15-30 per cent ("monocytic stage of defence"), (4) lymphocytosis. A marked lymphocytosis of 40 per cent or more is commonly seen and is usually accompanied by an eosinophilia of 4-10 per cent. This is the last or "healing" stage.

Several modifications of the Schilling method have been practised: the filament or non-filament count (Farley, St. Clair, and Reisinger), the Cooke index (Cooke and Ponder). They are all similar, and it becomes a matter of taste which index one uses. It must not be supposed that these methods of making a differential count of the white blood cells represent short cuts for the formulation of a clinical diagnosis. By adding another feature to the mosaic which, in its entirety, represents a diagnosis, they are however of distinct value.

D. The Monocyte, the Histiocyte, Supravital Studies. The monocyte has become the most widely discussed of the blood cells. There are two reasons for this: (1) it is in all probability the direct representative in normal, circulating blood of the reticulo-endothelial system which has loomed so large in recent years, (2) by its separation as a cell distinct from both the myeloid and the lymphocytic series, its importance in the differential count of the white blood cells has become distinctly greater and therefore a matter worthy of careful study.

The cell is easily recognized if various characteristics of cytoplasm and nucleus are kept in mind. It is the largest normal cell of the circulating blood, 12-20 micra in size, oval in shape, frequently irregular in outline with "pseudopods" jutting off from its borders. The cytoplasm is stained grayish-blue with Wright's stain and contains innumerable very small violet granules. The nucleus fills about 0.7 of the cell, is usually indented and bean-shaped in outline and is made up of fine chromatin network.

Supravital investigations popularized by Sabin have shown that the cell is actively motile through the formation of pseudopods, and gathers neutral red granules in the bend of the nucleus. Much has been written in recent years of the supravital method for studying the white blood cells (Cunningham and Tompkins¹). Some authors have claimed that only by this

method is it possible to distinguish clearly the monocyte from the large lymphocyte and thus perform a careful differential count in certain diseases in which the percentage of monocytes may be of value (Blackfan and Diamond, Hertz and Lerman). It is the reviewer's opinion that the importance of supravital study of the blood cells has been overemphasized. It is possible, by careful study of the stained blood smear, to differentiate clearly the large lymphocyte and the monocyte. The supravital method is not without its own intrinsic errors, not to speak of the difficulty attending its use in ordinary clinical practice (Tompkins, Hall). The writer has found it to be of limited value, particularly in the study of the frequently atypical cells of acute leukemia, in the differentiation of the monocyte and the abnormal lymphocytes in "infectious mononucleosis" (at times a difficult matter) and in the study of certain aspects of the physiology of the white blood cells.

The *monocyte-lymphocyte ratio* (M L ratio) has been made much of since Cunningham, Sabin et al. demonstrated that in active tuberculosis of experimental animals, the monocyte was the important type cell of the infection and became much increased at the expense of the lymphocyte. With development of the disease, these investigators found that the ratio of monocytes to lymphocytes, normally about 0.3 to 1, became frequently 1 to 1 or higher. Cunningham, Sabin, Sugiyama, and Kindwall and Cunningham and Tompkins² studied the M L ratio in clinical tuberculosis and found it to be of value in the prognosis and follow-up of the disease. Many investigations were made of its clinical value and were followed by enthusiastic reports, which have however not been fully sustained. It is true that the monocytes become increased in tuberculosis and that at times, the M L ratio is greater than 1. This may hold true much more for infants (anergic individuals) than for adults in whom allergy and superimposed infections complicate the picture. Various investigators have pointed out that the Schilling hemogram gives much more information than does the calculation of the M L ratio.

Again, monocytosis accompanies most subacute infections (sinusitis, general paresis, subacute bacterial endocarditis), the M L ratio frequently becoming increased. The normal monocyte count is 8-12 per cent of the total white blood cells and becomes increased not only in subacute infections but in typhoid fever, chronic sepsis, agranulocytosis, hyperthyroidism and Hodgkin's disease. With marked increase in monocytes, it is usual to find an occasional histiocyte (Dameshek).

The *histiocyte* is never seen normally, but only in those conditions in which a monocytosis is present (i.e., in overactivity of the reticulo-endothelial system). It is extremely large, ex-

tremely irregular in shape, usually with pseudopods. The cytoplasm is sky-blue in color, frequently contains phagocytosed material and vacuoles. The granules are large, azure and grouped about the nucleus. The latter is typically "spongy" with a loose chromatin mesh and a thick perinuclear membrane. Supravitality, this cell is distinguished by its rapid motility and its phagocytic tendencies. Its appearance in the circulation has been emphasized in subacute bacterial endocarditis, but the reviewer has demonstrated its frequent presence in other conditions (Dameshek.)

E The Blood Platelets Many methods for the enumeration of the blood platelets have appeared in the last few years. Several of these have emphasized the inaccuracy of the platelet counts and the probably low figure ordinarily given for the blood platelet count (about 200 000 per cu mm) (Olef). The reviewer by studying a large series of normal men and women found that the normal range of count in men is 600 000 to 900 000 but that in women the count is complicated by the menstrual cycle. With menstruation, there is an extreme rise in the platelet count, between periods the count being relatively low. The "direct" method for counting blood platelets is probably grossly inaccurate, indirect counting by studying under oil immersion the relation of the blood platelets to 1000 red blood cells being of much greater accuracy. A few authors have recently touched upon the changes in the morphology of the platelets which may occur in various conditions (Pepper and Farler, Mackay). Study of the platelets becomes important, not only in the hemorrhagic diseases, but in the estimation of the function of the bone-marrow. With the white blood cell count, the number of polymorphonuclear cells, and the percentage of reticuloocytes, enumeration of the platelets gives a complete index of bone-marrow activity.

F The Red Blood Cells These cells, peculiar in their absence of a nucleus and in their remarkable affinity for oxygen and carbon dioxide, have been shown to be intimately concerned with gastric digestion which apparently elaborates a specific growth producing hormone (*stroma-building substance*, "addisin") (See Castle and Morris et al under "The Macrocytic Anemias"). Without this substance, the marrow red blood cells do not mature, and an embryonic (megaloblastic) type of red blood cell formation takes place with resultant macrocytic (pernicious), anemia. Stroma may be built up in the absence of iron-containing foods, but the red blood cells in an iron-deficiency state become achromic, there is a low "color" index, and obviously their oxygen-carrying efficiency or capacity becomes impaired.

The stage before the formation of the completely adult red blood cells is the *reticulocyte*, which, when stained supravitality, shows a distinct network. The reticulocyte has become the

indispensable tool for investigations regarding the efficacy of various substances used in the treatment of pernicious anemia. Although not generally known, it is also valuable in estimating the response in the hypochromic ("secondary"), anemias to iron and other therapy (Keefer and Yang, Minot and Heath, Mettler and Minot, Dameshek.)

The great majority of mankind possesses round red blood cells. A few families, generally of the colored race, possess cells which are longer in one diameter than in the other. These are at times oval at times elliptical, at times even "sickled." This disorder of the red blood cells, apparently an inherited characteristic, is not limited to the colored race, but may be seen in whites (Literature well reviewed by Steinberg). A Jewish family showing oval and elliptical cases was recently studied by the writer at the Beth Israel Hospital. Sick-cell anemia appears to be the ultimate in this abnormality of the red blood cells.

Knowledge of the *blood-groups* has become all-important in the matter of blood-transfusion. Much confusion having arisen between the Moss and Jansky classifications, an international classification was devised in which the blood corpuscles are classified according to their content of agglutinin-forming substance (agglutinogens). Thus the four groups are

O (Type I Jansky, universal recipient, contains no agglutinogens)

A (Type II Jansky, contains agglutininogen A)

B (Type III Jansky, contains agglutininogen B)

AB (Type IV Jansky, *universal donor*, contains both agglutinogens)
(See Snyder)

The blood-groups are also utilized occasionally as a test for paternity. Wiener has shown that the chances for diagnosing paternity which are about 1 to 6 using the above groups are increased to 1 to 3 when the recently discovered groups M and N are utilized. For further details, the reader is referred to Wiener's articles.

The *sedimentation rate* of the red blood cells may be mentioned in passing. For careful investigations of this phenomenon, the reader is referred to the articles of Rourke and Ernestine. The sedimentation rate is chiefly useful in following along various chronic or subacute infectious states such as tuberculosis and rheumatic fever. If used as a routine measure in a large clinic, it may occasionally aid in establishing the presence of organic disease in a patient.

III. DISORDERS OF THE BLOOD-FORMING ORGANS

A. Associated Physiological Factors The bone-marrow, the lymph-nodes, and the reticulo-endothelial system have already been mentioned. The relationship of the stomach to red blood cell formation has been commented upon and

will be discussed in greater detail below. The intestines are also concerned because of their importance in the absorption of both stroma-building and hemoglobin-building material. With marked anemia, there are frequently lingual disorders (glossitis, atrophy of the tongue, etc.) and disorders of the central nervous system. Red cell destruction by the reticulo-endothelial system is a constant accompaniment of red cell formation and the chief product of this destruction is the non-iron containing yellow pigment bilirubin. With increased red blood cell destruction, there is an increase in the content of bilirubin in the blood (icterus).

The blood clots because of its content and quality of blood platelets. In hemophilia, although the platelets are normal in number, they are apparently deficient in quality, and the coagulation time is increased. In thrombocytopenic purpura, the platelets are diminished and although the blood clots in normal time, the bleeding time from small capillaries is much increased. In certain conditions, the red blood cells are more fragile to hypotonic salt solutions.

B Outline for Study of a Patient

History

Physical Examination Particular reference to the following: *pallor*—("palm color" test very satisfactory—Duke), appearance of *tongue* (papillae, shiny appearance, coat, etc.), *finger nails* (see under Primary Hypochromic Anemia), *hair* (see under Pernicious Anemia and Primary Hypochromic Anemia), *lymph-nodes*, *size of spleen* (percussion and palpation), *clerae of eyes* for icterus, *reflexes*, *vibratory sensation* of the extremities with tuning fork, *skin* for ecchymoses and petechiae.

Laboratory Tests

Routine Hemoglobin (Tallqvist worthless, Sahli if calibrated with Van Slyke-Neill oxygen capacity, good*, Dare poor) RBC WBC Blood Smear differential count of the white blood cells with use of the Schilling hemogram, examination of the red blood cells for achromia, aniso- and poikilocytosis and polychromatophil-ia, blood platelets.

Anemia Blood platelet count, reticulocyte count, icterus index, quantitative bilirubin (Van den Bergh), measurement of the red blood cell diameter (micrometer eyepiece—Price-Jones), Hematocrit and determination of the various indices (volume index, mean corpuscular volume most valuable) (Haden, Wintrobe). Gastric analysis with histamine (Bloomfield and Pollard). Stool for occult blood. Bone-marrow biopsy in the rare difficult case. Fragility test in the anemias with jaundice.

*Leltz apparatus has been found satisfactory. Tendency in recent years has been to estimate hemoglobin in Grams per 100 cc. of blood. 100% is 17.2 grams by Sahli, 16.2 grams by Newcomer, 14.5 grams by Dare etc. See articles of Osgood and Haskins.

Leukemia As above. Oxidase test (Sato-Sekiya), supravital studies, bone-marrow biopsy.

Hemorrhagic Diseases Bleeding time. Clotting time. Clot retraction. Tourniquet test.

Lymph-node Enlargements Blood studies as above. X-ray chest. X-ray long bones. Bence-Jones protein in urine. Biopsy of a lymph node. Basal metabolism test.

C Bone-Marrow Disorders

1 The Red Blood Cells

(a) The Anemias

(aa) **Classification** There are various methods for classifying the anemias. Some of the more simple classifications are not inclusive and some of the more complex classifications become confusing. Primary, idiopathic, or essential anemias are contrasted with those secondary to known cause. In recent years it has seemed wise to classify red blood cell disorders on the basis of hemoglobin content, thus "macrocytic" refers to the anemias with large cell size and high color index and "hypochromic" to those with low color index, achromia, and small cell size. Among the macrocytic anemias (and those other anemias in which there is a deficiency in stroma-building substances) are pernicious anemia, and among the hypochromic anemias one finds not only primary hypochromic anemia but secondary anemias as well. Until the exact etiology of the anemias is known, it seems best to adopt these morphological criteria. Attempts have been made to classify the anemias on their pathological aspects. Thus, pernicious anemia is megaloblastic anemia, the name aplastic anemia is satisfactory, primary hypochromic anemia is erythronormoblastic anemia, congenital hemolytic jaundice is hyperreticulosis (Dameshek). This may become the method of choice if the pathological picture of each disease becomes well established. Other methods of classification which may be mentioned are those referring to blood and cell volume (Wintrobe, Haden, Osgood). For a good general discussion of the anemias see Witts. The most recent simple classification which I have used is the following:

a **Macrocytic**—large cells, high color index, high mean corpuscular volume. Includes pernicious anemia and associated conditions.

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c **Aplastic**—no growth of the marrow, resulting in marked diminution in red blood cells, white blood cells, and blood platelets.

d, **Myelophthisic**—invasion of bone-marrow by malignant or leukemic processes. Anemia, leukopenia and thrombocytopenia result with evidences of attempted regeneration.

e *Hemolytic*—increased destruction of red blood cells through overactivity of reticulo-endothelial system or by other cause. Includes congenital and acquired types.

(bb) *The Macrocytic Anemias*. The name of William B. Castle stands out brilliantly as the great investigator of those conditions characterized by anemia with large cell size and high color index. As the direct result of his investigations has come an entirely new conception of pernicious anemia as a conditioned deficiency disease dependent upon a gastric mucosa which is incapable of carrying out the first stage of protein digestion and thus nourishing the bone-marrow with the specific product apparently necessary for normal red blood cell growth (Castle *et al.*^{2,3}). As by-products have come the discoveries of the potency of gastric mucosa ("ventriculin") (Sturgis and Isaacs) and of concentrated gastric juice intramuscularly injected (Morris, Schiff, Burger, and Sherman).

Castle showed first that beefsteak given alone to patients with pernicious anemia was ineffective but that beefsteak when incubated with normal gastric juice produced as typical a reticulocyte and red blood cell response as though liver extract had been given. The gastric juice of the patient with pernicious anemia was evidently deficient in a substance ("x" factor) which was present in the normal gastric juice. Thus, protein could be eaten *ad libitum* by the patient with pernicious anemia but was without effect on the bone-marrow, i.e., a deficiency existed although sufficient material was ingested. This was a "conditioned" deficiency. Attempts to isolate in pure form this "x" substance have been unsuccessful although some of its characteristics are known, i.e., that it is probably an enzyme of organic nature, thermolabile and active in neutral solution. Cheney and Niemand have attempted to show that the possible enzyme is trypsin.

In further logically-drawn experiments, Castle *et al.* showed that pernicious anemia was a disease dependent upon the lack of interaction between an "extrinsic" factor (in the food) and an "intrinsic" factor in the gastric juice. It would therefore be possible theoretically to produce pernicious anemia by the absence of the "extrinsic" factor, even though the intrinsic factor was present. This reasoning led to Castle's brilliant investigations carried out with Rhoads in Porto Rico which showed that sprue was in reality pernicious anemia (Castle and Rhoads). In certain cases of sprue, the gastric juice contained the "x" factor but the dietary was so deficient in the extrinsic factor that a macrocytic anemia developed. The concept that pernicious anemia was only one of several macrocytic anemias was gradually built up. Thus macrocytic anemia could develop (1) in the absence of the extrinsic factor (poor dietary, sprue, certain cases of pellagra) (2) in the com-

plete absence of the intrinsic factor, (pernicious anemia) or during its temporary suppression (pernicious anemia of pregnancy, Strauss and Castle¹) (3) in severe diarrheas (ulcerative colitis—pancreatic disease—coeliac disease) in which although extrinsic and intrinsic factors were both present, there was deficient absorption by the intestine of the end-products of gastric digestion. Further experiments with the extrinsic factor by Strauss and Castle² demonstrated that not only beef but various other proteins were active. The final demonstrations led to the highly interesting discovery that vitamin B₁₂ was the simplest and most active extrinsic substance. At the present writing it would appear that the macrocytic anemias are vitamin deficiency diseases dependent upon the failure of the bone-marrow to receive either sufficient vitamin B₁₂ or a substance derived from this vitamin. This theory, built up so logically by Castle and his collaborators was recently jolted by the publication of the results of Morris *et al.*, who gave intramuscular injections of highly concentrated gastric juice to patients with pernicious anemia and produced striking response. Morris and his collaborators feel that the normal gastric juice contains a hormone (which they call "addisin") necessary for the normal functioning of the marrow. This hormone is apparently effective even in the absence of Castle's extrinsic factor. Further studies are necessary before these results can be completely accepted.

The treatment of pernicious anemia has become bewildering. Almost weekly, the clinician is regaled with some new product: Liver extract, gastric extract, combinations of liver extract with gastric extract (Fouts and Zervas), liquid liver extracts of various types, and recently numerous preparations for intramuscular injection have been introduced. There seems to be a definite trend away from the liver extract in powder form for oral use toward intramuscular products which are given by the physician at weekly or longer intervals. Numerous intramuscular products of various degrees of concentration have been placed on the market (Strauss, Taylor and Castle, Murphy, Richter, Meyer and Ivy). It is possible that some of these products have been inadequately assayed and that the potency of some is much greater than that of others. It is not yet known whether the material derived from 10 Gm of liver given intramuscularly represents a maximal quantity or whether it is necessary in a given case to administer doses of extract derived from 100 Gm of liver. All authorities are agreed that in those cases of pernicious anemia showing central nervous system lesions, maximal, frequently repeated doses are necessary to obtain beneficial results.

Cases of "combined system disease" are becoming recognized much more frequently. Often they are associated with what at first glance is

will be discussed in greater detail below. The intestines are also concerned because of their importance in the absorption of both stroma-building and hemoglobin-building material. With marked anemia, there are frequently lingual disorders (glossitis, atrophy of the tongue, etc.) and disorders of the central nervous system. Red cell destruction by the reticulo-endothelial system is a constant accompaniment of red cell formation and the chief product of this destruction is the non-iron containing yellow pigment bilirubin. With increased red blood cell destruction, there is an increase in the content of bilirubin in the blood (icterus).

The blood clots because of its content and quality of blood platelets. In hemophilia, although the platelets are normal in number, they are apparently deficient in quality, and the coagulation time is increased. In thrombocytopenic purpura, the platelets are diminished and although the blood clots in normal time, the bleeding time from small capillaries is much increased. In certain conditions, the red blood cells are more fragile to hypotonic salt solutions.

B Outline for Study of a Patient

History

Physical Examination. Particular reference to the following: *pallor*—("palm color" test very satisfactory—Duke), appearance of *tongue* (papillae, shiny appearance, coat, etc.), *finger nails* (see under Primary Hypochromic Anemia), *hair* (see under Pernicious Anemia and Primary Hypochromic Anemia), *lymph-nodes*, size of *spleen* (percussion and palpation), *sclerae of eyes* for icterus, *reflexes*, *vibratory sensation* of the extremities with tuning fork, *skin* for ecchymoses and petechiae.

Laboratory Tests

Routine. Hemoglobin (Tallqvist worthless, Sahli if calibrated with Van Slyke-Neill oxygen capacity, good*, Dare poor). RBC WBC Blood Smear differential count of the white blood cells with use of the Schilling hemogram, examination of the red blood cells for achromia, aniso- and poikilocytosis and polychromatophil-ia, blood platelets.

Anemia. Blood platelet count, reticulocyte count, icterus index, quantitative bilirubin (Van den Bergh), measurement of the red blood cell diameter (micrometer eyepiece—Price-Jones), Hematocrit and determination of the various indices (volume index, mean corpuscular volume most valuable) (Haden, Wintrobe). Gastric analysis with histamine (Bloomfield and Pollard). Stool for occult blood. Bone-marrow biopsy in the rare difficult case. Fragility test in the anemias with jaundice.

*Leitz apparatus has been found satisfactory. Tendency in recent years has been to estimate hemoglobin in Grams per 100 cc. of blood. 100% is 17.2 grams by Sahli, 16.2 grams by Newcomer, 14.5 grams by Dare etc. See articles of Osgood and Haskins.

Leukemia. As above. Oxidase test (Sato-Sekiya), supravital studies, bone-marrow biopsy.

Hemorrhagic Diseases. Bleeding time. Clotting time. Clot retraction. Tourniquet test.

Lymph-node Enlargements. Blood studies as above. X-ray chest. X-ray long bones. Bence Jones protein in urine. Biopsy of a lymph node. Basal metabolism test.

C Bone-Marrow Disorders

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ment, small doses of copper sulphate (0.005 Gm daily) given together with large doses of iron, almost always cause resumption of hemoglobin rise

Most authorities agree that liver is of no value in these cases, although Murphy concludes that intramuscular liver, given as an adjunct to iron therapy, is of distinct value. The various proprietary "shot-gun" mixtures which contain iron, liver, hemoglobin, copper, etc., are much more expensive and of no greater value than their contained iron. The exact place of copper in the treatment of this type of anemia in man has still to be settled, although it has several protagonists.

(dd) *Secondary Anemias* These are treated in much the same way as the above, but with the added responsibility of dealing with the cause. In the presence of infection or malignancy but little headway can be made against anemia. The same holds true with chronic nephritis in which the prognosis can often be gauged by the extent of the anemia.

(ee) *Aplastic Anemia* In the past the great majority of cases of aplastic anemia (striking anemia, leukopenia, thrombocytopenia) were thought to be primary or idiopathic in type, but in recent years so many substances have become incriminated as the cause of bone-marrow aplasia that it behooves the physician to search for a cause in each case diagnosed as aplastic anemia. Arsenic, arsphenamine, x-rays, radioactive materials, benzol and silver have been shown to cause destruction of bone-marrow tissue, usually total at times selective. If selective, only anemia or leukopenia or thrombocytopenia may develop. Very recently gold (sancervsin, gold sodium thiosulphate) has been found to cause various bone-marrow disorders and the writer has observed a typical case of aplastic anemia following its use in the treatment of lupus erythematosus.

The treatment of aplastic anemia is the use of repeated transfusions of blood until the patient either shows signs of recovery or until proof is presented that no evidence of bone-marrow regeneration exists. Recently pentnucleotides (see under Agranulocytosis) have been used with possibly successful results in a few chronic cases. Some observers recommend splenectomy which is supposed to remove an organ inhibitory to the marrow.

(ff) *Anemias of Children* These differ but little from those of adults except that changes may progress more rapidly, response may be more marked, evidences of immaturity of cells may be more striking. However, in the last few years, two types of anemia occurring only in children have been stressed. These are (Cooley's) erythroblastic anemia and erythro-

blastosis of the new-born. Cooley's anemia is present chiefly among children of Mediterranean origin (Italians, Portuguese, etc.) and is characterized by marked splenomegaly, striking anemia with the presence of large numbers of immature nucleated red blood cells (erythroblasts) in the circulating blood (Kato and Downey). At times cranial defects with the presence of striae by x-ray are present. Splenectomy is at times of curative value.

Erythroblastosis of the new-born is characterized by intense jaundice, edema and striking anemia, the peripheral blood containing all of the elements ordinarily seen only in the bone-marrow: myeloblasts, myelocytes, megaloblasts, erythroblasts, bits of megakaryocytes, etc. Pathologically, Ferguson and others have shown that the outstanding feature is the occurrence of abnormal extramedullary hematopoietic activity of an embryonic type ("megaloblastic, hemohistioblastic erythroblastic" according to the author). The jaundice is apparently due to "excessive hemolysis of large numbers of imperfectly differentiated erythrocytes loading the liver cells with bile pigment more rapidly than it could be taken care of by the bile excreting apparatus" (Ferguson). The edema is probably due to hypoproteinemia and is related to the previously described hydrops of the new-born.

An interesting condition apparently more common in infants than in older children and possibly congenital in nature is aplastic anemia (Morquio and Volpe).

(b) *Polycythemia Vera* The production of red blood cells in the bone-marrow is tremendously increased in this condition; the erythrocyte count often reaching ten to twelve million. Some observers have contended that the erythrocytosis is neoplastic in type but it is probable that the disorder is frequently constitutional or hereditary and begins early in life. It usually goes unrecognized (except in medical students doing red counts) until the patient presents himself with heart disease, arteriosclerotic manifestations including thrombosis, or hemiplegia. The importance of arteriosclerotic disorders in this disease cannot be overemphasized (Brown and Griffin). The spleen is enlarged in almost every case except possibly in the special (?) type associated with hypertension (Gaisböck). Morris has recently advanced the interesting suggestion that the underlying cause is intense bone-marrow stimulation from overproduction of "addison" (see under Pernicious Anemia) in the gastric juice. He advises, therefore, the daily removal of gastric juice. Forkner has recently stressed the use of large doses of Fowler's solution which will reduce not only the red cell count but also the high white blood cell count and the blood platelets. Numerous observers stress the value

an almost normal blood picture. However, careful investigation will usually show the following: slight reduction in red blood cells (3.5-4.0 million), high color and volume index, increased mean corpuscular volume, low white blood cell count, macrocytes, presence of "pernicious anemia-neutrophiles", slight diminution in blood platelets, slight increase in icterus index, complete achlorhydria. At times, no blood changes can be recognized or there is even a hypochromic picture. The full-blown case is characterized clinically by spasticity, increased knee and ankle-jerks, positive Babinski response, and absent vibratory sensation. However, all gradations exist between this type of case and that showing only paresthesias of the extremities with diminished vibratory sensation together with glossitis and achlorhydria. It is becoming more and more evident that prolonged intensive treatment with intramuscular liver extracts will benefit the great majority of these cases, even those which appear hopeless (Greenfield and O'Flynn, Baker). The mild ones may expect complete recovery, and even those with extreme spasticity and signs of degeneration of the posterior columns frequently become strikingly improved. It is probable that the best results are obtained from frequently repeated injections of concentrated extracts of liver.

Cases of macrocytic anemia not idiopathic in type but associated with pregnancy, fish tape-worm (Birkeland), tuberculosis, syphilis, sprue, poor dietary, etc., are treated in identical fashion with pernicious anemia and with as good results, despite the presence of these other factors. Attempts should be made, however, to clear up associated conditions.

(cc) *Hypochromic Anemias*

One of the most interesting of recent developments in hematology has been the exclusion from the large ill-defined category called "secondary anemia" of a group of cases which has been called "primary or idiopathic hypochromic anemia." In these cases, although the blood-picture is that of "secondary anemia", (low color index, achromia of the red blood cells) no apparent cause for this abnormal blood picture can be demonstrated. Kaznelson, Reimann and Weiner, Davies, Witts, Haden, Wintrobe and Beebe, Dameshek and others have shown that the disease is almost wholly confined to women, usually in middle life, who complain of weakness, lassitude, burning tongue, paresthesias, gastro-intestinal disturbances, and brittle finger-nails. Examination discloses "white" pallor, usually grey hair, an atrophic tongue which is usually distinctly reddened and devoid of coat and papillae, and frequently flattened, hollow finger-nails. The hemoglobin is depressed to a far greater degree than is the red blood cell count (ordinary findings are hemoglobin 40%, red blood cell count 3.5 million), the

color index is very low, the white blood cell count is low, 3000-6000, the blood platelets are somewhat reduced, the polymorphonuclears are usually reduced and the red blood cells show marked achromia and are smaller than normal in average size (microcytosis). In almost every case, gastric analysis reveals complete achlorhydria even after stimulation with histamine. Dameshek¹ showed that the bone marrow, despite the anemia, is crowded with nucleated red blood cells of the normal type (erythroblasts, normoblasts). A striking feature is the dramatic response to large doses of iron which result in definite reticulocyte response, a rapid rise in hemoglobin, increased appetite, gain in weight, and subsidence of all the symptoms. There is tendency to relapse, however, when medication is discontinued.

The many features which this disease presents in common with pernicious anemia have been the subject of much comment and it is doubtless true that the disease is just as "primary" as pernicious anemia. Davies, Wintrobe and Beebe, Kaznelson, Reimann and Weiner, and the reviewer, suggested that a gastric defect is present interfering with the normal digestion of iron-containing foods and resulting in an iron deficiency. An experiment along the lines of Castle's work with pernicious anemia was done by Dameshek² with suggestive results.

Most cases are completely idiopathic, but some are associated with menstrual bleeding (which often diminishes when the anemia improves), some with pregnancy, myxedema, tape worm, or dysphagia (Plummer-Vinson syndrome). The factor common to these cases seems to be a gastric defect which is shown clinically as achlorhydria. Individuals with this defect appear to be more vulnerable to the development of anemia so that when a factor such as poor dietary, pregnancy, etc., appears, anemia of the hypochromic type is very likely to occur.

The disease, which appears to be an actual deficiency in iron (Heath, Strauss, and Castle, Alt) is treated by the use of large doses of iron. Minot, Heath, Dameshek³ and others have demonstrated that at least 1000 mgs of available iron are necessary for maximal results in most cases. To obtain this, the following daily dosages of the various iron compounds are necessary:

Ferric ammonium citrate	6 Gm
Reduced iron	3-6 Gm
Bland's pills	20 pills
Ferrous chloride	20 Gm
Ferrous glutamate	6 Gm

Certain cases need larger doses of iron. When tremendous doses of iron cause no further rise in hemoglobin, copper may be tried. The reviewer has noted that when the hemoglobin percentage becomes "fixed" during iron treat-

may be given with much success in tiding a patient over a relapse

(b) *Non-Thrombocytopenic Purpuras* Thrombocytopenic purpuras must be sharply differentiated from purpuric disorders, associated with normal blood platelet counts. Mention has been made that blood seeps out from the capillaries when the platelet count reaches a certain critical level. Leakage may also occur when the capillary wall is damaged although the blood platelet count is normal. Frank calls this condition "hemorrhagic capillary toxicosis". Schönlein's and Henoch's purpuras are probably of this type of disorder, as are the rheumatic purpuras, the infectious purpuras, those due to various chemicals such as arsenic, arsphenamine, phosphorus, gold, and to snake venom. The name "anaphylactoid purpura" has been applied by several writers (first used by Glanzmann) to this type of disorder, which in some ways is allied to urticaria, and occurs characteristically with serum sickness. The serum of horses immunized to increasing doses of snake venom ("anti-venin") has been used by some (Stockton and Franklin) in the treatment of this type of disorder with apparently good results.

(c) *Hemophilia* In hemophilia the blood shows diminished tendency to clot. There is usually no spontaneous bleeding as in the purpuras, the bleeding following trauma and involving fairly large blood-vessels. Thus bleeding occurs following operations, fairly large cuts, trauma to joints, etc. Petechiae do not occur. This is probably due to lack of capillary involvement and to the normal blood platelet count. Recent investigators have adduced evidence which indicates that although the blood platelet count is normal, the platelets are qualitatively modified and do not clump together properly to form thrombi in response to trauma (Birch¹). The occurrence of hemophilia in males, although the disease is transmitted by females, led Carol La Fleur Birch² to suggest that males developed the disease because they did not possess ovarian hormone. Later, this investigator² differentiated hemophilic males and non-hemophilic males by determining that the latter had more "femaleness" than the former and thus did not bleed. She carried out her theories by treating hemophilics with ovarian substances. In one instance, she transplanted a normal ovary into the abdominal wall of a hemophilic with apparently good results. A few reports of the apparently successful treatment of hemophilia with ovarian substance have served to confirm her work, which is still, to be sure, in the experimental stage. Brown and Albright have recently cast doubt upon the therapeutic effect of ovarian substance (estrim) in the disease.

(D) *The Leukemias* As noted above, there are three types of white blood cells (1) the granulocytes (2) the lymphocytes, and (3) the

monocytes. These owe their origin in the blood stream to three separate sources (1) the bone-marrow (2) the lymphoid tissue and (3) the reticulo endothelial system. Leukemia might be better termed "leukosis" since it represents pathologically a generalized proliferation of the various types of white blood cells. This may be manifested by a high white blood cell count in the peripheral blood (leukemia) but may be associated with a normal or even low white blood cell count ("aleukemic leukemia"). Since there are three types of white blood cells and three separate blood-forming organs, three types of leukosis are possible. For many years, only myelogenous and lymphatic leukemias were thought to be present, but beginning with Schilling's publication in 1914 and culminating in recent years with a number of papers (Dameshek¹, Clough) the concept of monocytic leukemia as a third type of leukemia has become well established. This is characterized by proliferation of reticulo endothelial cells throughout the body and, usually, by a tremendous number of mono- and histiocytes in the peripheral blood. An aleukemic form—aleukemic reticulosis (Dameshek²) is also described.

Leukoses may thus be myelogenous, lymphatic and monocytic. They may be associated with large numbers of circulating white blood cells or the white cell count may be diminished. Instead of the awkward term "aleukemic leukemia", it is probably better, as suggested by Piney, to use the terms "aleukemic myelosis", "lymphadenosis", and "reticulosis". Most observers feel that the leukoses are neoplastic proliferations of the various types of white blood cells, although Sternberg and others attack this view, particularly with reference to the acute leukoses, which, it must be admitted, resemble closely severe infectious processes.

Special reference should be made to the aleukemic leukoses. In an experience of about 100 cases of the various types of leukosis, the author has found that *the great majority are aleukemic*. These cases usually present themselves with anemia. In the aleukemic myelogenous type, splenomegaly is the outstanding feature. Because of this, Banti's disease or splenic anemia is frequently diagnosed, and pernicious anemia and secondary anemia are often considered. In the lymphatic type, generalized lymphadenopathy is almost always present. In the monocytic type, the lymph-nodes and the spleen are only slightly enlarged. All types are associated with moderate or severe anemia, leukopenia or a normal white blood cell count and thrombocytopenia. The anemia is frequently macrocytic in type and pernicious anemia is often diagnosed. Because the leukocyte count is low, agranulocytosis is considered. In the presence of ecchymoses and bleeding, the diagnosis of purpura hemorrhagica is frequently made. The reduction in red blood cells, white blood cells and in platelets suggests a "destructive" process of

of radiotherapy as a means of reducing cellular growth in the marrow. Phenylhydrazine hydrochloride continues, however, to hold a leading place in treatment in dosages of 0.030 to 240 daily, dependent upon the individual involved. Frequent counts of the red and white blood cells and observation of the patient for icterus are necessary during this form of therapy. When the red cell count remains fixed at 5.0 million or thereabouts, a maintenance dose of about 120 to 150 mgs weekly is usually effective. Recently acetylphenylhydrazine has been reintroduced. The warning must be given that it is necessary to treat not only the red blood cells but the patient as well. Some patients have been irremediably damaged by too strenuous efforts to treat the red blood cells rather than the patient.

2 White Blood Cells

(a) *Agranulocytosis* Since publication of the last report on progress in hematology, a new disorder has been generally recognized, widely reported from over the entire world, classed as almost always fatal, and finally to a great extent conquered. Reported as agranulocytic angina by W. Schultz in 1922 because of the severe throat lesions associated with lack of granulocytes in the peripheral blood, the name was gradually modified to agranulocytosis because of the many cases reported in which angina was absent. To some the word agranulocytosis is objectionable and such terms as malignant neutropenia, primary granulopenia, primary granulocytopenia have been proposed (excellent review of the subject by Beck). Although granulocytes may disappear from the peripheral blood in the course of severe infectious states, it has gradually become manifest that agranulocytosis does not represent an infection but is a primary bone-marrow disorder in which the white blood cell forming mechanism becomes depressed (Beck, Roberts and Kracke, Doan). The cause for this phenomenon is not known, but gradually, as the supply of the white blood cells in the peripheral blood becomes depleted, the patient begins to feel weak, depressed, and finally develops various lesions of mucous membranes (Roberts and Kracke, Doan, Dameshek). These in all probability are the result of unrestrained bacterial growth in the absence of granulocytes. The fully-developed clinical picture has been well described by many observers. At first, the disease was considered universally fatal, but occasional instances of spontaneous recovery were later noted. These were associated with a marked degree of monocytosis, indicating possibly that the reticulo endothelial system was assuming some of the burden (Dameshek and Ingall). In 1930, Reznikoff used the nucleic acid derivatives adenine sulphate and guanine hydrochloride for raising the white blood cell count in cases of agranulocytosis. In 1932, Jackson et al introduced the "unbroken" pentose nucleotides (also derived from nucleic acid)

which he and his co-workers used later in a large series of cases with excellent results. The mortality rate for agranulocytosis, 90 per cent before the advent of these measures, became quickly reduced to 10-20 per cent. Nucleic acid derivatives were for many years known to investigators as substances capable of raising the white blood cell count in animals. Their apparently specific results in cases of agranulocytosis, bringing about on the third to fifth day an increase in immature polymorphonuclears followed by an outpouring of more mature forms has been one of the most striking phenomena in present-day annals of therapeutics. The use of nucleotides in various infectious states attended with leukopenia has not been attended with much success. Some of the failures in the treatment with nucleotides are probably due to incorrect diagnosis, many physicians making the diagnosis of agranulocytosis merely because the white blood cell count is low, although the underlying condition may be (and frequently is) a leukemic process of the leukopenic or aleukemic variety or an aplastic anemia. Very recently liver extract has been injected intramuscularly with good results in a few cases (Foran, Sheaff, and Trimmer).

It must be remembered that in true agranulocytosis only the white blood cell forming elements are affected, the red blood cells and platelets being unaffected. As the cases of agranulocytosis have become pedigreed, their striking tendency to relapse has become well established as has the "neutropenic state" (Doan) with its accompanying weakness, fatigue, and depression.

(b) *Myelosis (Myelogenous Leukemia)*—see under "Leukemias"

3 The Blood Platelets

(a) *The Platelet Deficiencies and the Hemorrhagic Disorders* The blood platelet count taken together with the reticulocyte count and the count of the polymorphonuclear cells offers a complete index of the function of the bone marrow. The blood platelets are diminished when the bone-marrow is totally destroyed (aplastic anemia), when it is invaded by malignant disease (lymphosarcoma, leukemias) and in the disorder variously called thrombocytopenic purpura or purpura hemorrhagica. Blood escapes from capillaries when the blood platelet count reaches a "threshold level" which varies in individual cases, but is usually between 40,000 to 60,000 per cu mm. This escape of blood from capillaries produces petechiae, usually first seen in the translucent mucous membranes, later in the skin. Larger hemorrhages produce ecchymoses. The cause of this marked deficiency in platelets when the rest of the bone-marrow is unaffected (white cell count and red cell count being normal or only slightly modified) is still unknown. Splenectomy is still being performed in the condition with good results. Transfusions

may be given with much success in tiding a patient over a relapse

(b) *Non-Thrombocytopenic Purpuras* Thrombocytopenic purpuras must be sharply differentiated from purpuric disorders, associated with normal blood platelet counts. Mention has been made that blood seeps out from the capillaries when the platelet count reaches a certain critical level. Leakage may also occur when the capillary wall is damaged although the blood platelet count is normal. Frank calls this condition "hemorrhagic capillary toxicosis." Schönlein's and Henoch's purpuras are probably of this type of disorder, as are the rheumatic purpuras, the infectious purpuras, those due to various chemicals such as arsenic, arsphenamine, phosphorus, gold, and to snake venom. The name "anaphylactoid purpura" has been applied by several writers (first used by Glanzmann) to this type of disorder, which in some ways is allied to urticaria, and occurs characteristically with serum sickness. The serum of horses immunized to increasing doses of snake venom ("anti-venin") has been used by some (Stockton and Franklin) in the treatment of this type of disorder with apparently good results.

(c) *Hemophilia* In hemophilia the blood shows diminished tendency to clot. There is usually no spontaneous bleeding as in the purpuras, the bleeding following trauma and involving fairly large blood-vessels. Thus bleeding occurs following operations, fairly large cuts, trauma to joints, etc. Petechiae do not occur. This is probably due to lack of capillary involvement and to the normal blood platelet count. Recent investigators have adduced evidence which indicates that although the blood platelet count is normal, the platelets are qualitatively modified and do not clump together properly to form thrombi in response to trauma (Birch¹). The occurrence of hemophilia in males, although the disease is transmitted by females, led Carol La Fleur Birch² to suggest that males developed the disease because they did not possess ovarian hormone. Later, this investigator² differentiated hemophilic males and non-hemophilic males by determining that the latter had more "femaleness" than the former and thus did not bleed. She carried out her theories by treating hemophiliacs with ovarian substances. In one instance, she transplanted a normal ovary into the abdominal wall of a hemophilic with apparently good results. A few reports of the apparently successful treatment of hemophilia with ovarian substance have served to confirm her work, which is still, to be sure, in the experimental stage. Brown and Albright have recently cast doubt upon the therapeutic effect of ovarian substance (estrin) in the disease.

(D) *The Leukemias* As noted above, there are three types of white blood cells (1) the granulocytes (2) the lymphocytes, and (3) the

monocytes. These owe their origin in the blood stream to three separate sources (1) the bone-marrow (2) the lymphoid tissue and (3) the reticulo-endothelial system. Leukemia might be better termed "leukosis" since it represents pathologically a generalized proliferation of the various types of white blood cells. This may be manifested by a high white blood cell count in the peripheral blood (leukemia) but may be associated with a normal or even low white blood cell count ("aleukemic leukemia"). Since there are three types of white blood cells and three separate blood-forming organs, three types of leukosis are possible. For many years, only myelogenous and lymphatic leukemias were thought to be present, but beginning with Schilling's publication in 1914 and culminating in recent years with a number of papers (Dameshek¹, Clough) the concept of monocytic leukemia as a third type of leukemia has become well established. This is characterized by proliferation of reticulo endothelial cells throughout the body and usually, by a tremendous number of mono- and histiocytes in the peripheral blood. An aleukemic form—aleukemic reticulosis (Dameshek²) is also described.

Leukoses may thus be myelogenous, lymphatic and monocytic. They may be associated with large numbers of circulating white blood cells or the white cell count may be diminished. Instead of the awkward term "aleukemic leukemia" it is probably better, as suggested by Pinev, to use the terms "aleukemic myelosis", "lymphadenosis", and "reticulosis". Most observers feel that the leukoses are neoplastic proliferations of the various types of white blood cells, although Sternberg and others attack this view, particularly with reference to the acute leukoses, which, it must be admitted resemble closely severe infectious processes.

Special reference should be made to the aleukemic leukoses. In an experience of about 100 cases of the various types of leukosis, the author has found that *the great majority are aleukemic*. These cases usually present themselves with anemia. In the aleukemic myelogenous type, splenomegaly is the outstanding feature. Because of this, Banti's disease or splenic anemia is frequently diagnosed, and pernicious anemia and secondary anemia are often considered. In the lymphatic type, generalized lymphadenopathy is almost always present. In the monocytic type, the lymph-nodes and the spleen are only slightly enlarged. All types are associated with moderate or severe anemia, leukopenia or a normal white blood cell count and thrombocytopenia. The anemia is frequently macrocytic in type and pernicious anemia is often diagnosed. Because the leukocyte count is low, agranulocytosis is considered. In the presence of ecchymoses and bleeding, the diagnosis of purpura hemorrhagica is frequently made. The reduction in red blood cells, white blood cells and in platelets suggests a "destructive" process of

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A proliferative disorder of lymphocytes benign in type and probably infectious in origin has been called "infectious mononucleosis." This term is unfortunate for several reasons. In the first place, the cells are typically lymphocytes of various stages of maturity and not monocytes. As noted above the term "large mononuclear cell" has to a great extent been discarded and replaced by the more precise terms large lymphocyte and monocyte. Longcope was not certain of the exact type of cell concerned in the blood-picture of what had until his studies been called "glandular fever" and so used the indefinite name "infectious mononucleosis." Again, from the purist's standpoint how can a "mononucleosis" be infectious? It is better in the reviewer's opinion, to use the old term "glandular fever." Epstein and Dameshek recently reported the case of an individual showing the signs of a meningo-encephalitic process with lymphocytes in the spinal fluid. This patient on further study was found to show the typical clinical and hematological features of glandular fever. These authors speculated regarding the possibility that some of the cases reported as "aseptic lymphocytic meningitis" might in reality be cases of glandular fever with lymphocytes in the spinal fluid.

In recent years more knowledge has been accumulating concerning the exact nature of the so called multiple myeloma. Various authors, including Jackson, Parker and Bethea, and Bross have demonstrated that "multiple myeloma" is in reality a neoplasm made up of plasma cells (plasmacytoma) metastasizing from an original focus (tonsils etc.) into the bone-marrow and causing the typical punched-out appearance of the bones seen by x-ray. Many authors consider the plasma cell to be an abnormal lymphocyte. (For discussion of plasma cell see Michels.) The occurrence of Bence-Jones proteinuria in plasmacytoma has been the occasion for some interesting studies (Bönninger, Wintrobe and Buell). Apparently the kidneys are frequently involved in the disease with resultant nephrotic changes and proteinuria of the peculiar type described by Bence-Jones.

2 Disorders of the Reticulum Cells (See under Disorders of the Reticulo-Endothelial System)

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A remarkable step in advance has been the recognition and detailed description of the so called "storage disorders" of the reticulo-endothelial system (Derischanoff). Gaucher's disease is characterized by hepato- and splenomegaly, a slight degree of anemia, and patholog-

ically by "foam cells" throughout the liver, spleen, bone-marrow, and lymph-nodes. The disease has been found to be due to the presence of large amounts of a fatty substance (kerasin) in the reticulo-endothelial cells of the entire body (Epstein). In the presence of xylol, alcohol etc. which are used in the preparation of paraffin tissues, the fatty substance present in these cells becomes dissolved leaving a characteristic "foam" appearance. Bone lesions are interesting and should always be looked for (Welt, Rosenthal and Oppenheimer). Splenectomy is of no avail in this generalized process which is frequently familial and usually found in Jewish families (Welt et al, Anderson). Closely allied to this disorder is xanthomatosis in which the same cells store large amounts of cholesterol (Rowland). The bone-marrow often becomes filled with large plaques of cholesterol-containing cells with resultant erosion and the formation of bone defects, usually seen in the skull. The reticuloendothelial cells of the skin and subcutaneous tissue also may become distended with this fatty substance resulting in the formation of the yellowish tumors called xanthomata. When these are present in the orbit, exophthalmos results. Christian described "defects in the membranous bones, diabetes insipidus and exophthalmos" in a few patients. Rowland did a great service by putting together all the various disorders associated with increased cholesterol storage in the reticuloendothelial cells and showed conclusively that Christian's syndrome (Hand-Schüller-Christian syndrome) was simply one manifestation of xanthomatosis. Lipoid histiocytosis (Niemann-Pick's disease) is an associated very rare disorder of infants characterized by abnormal storage of various types of lipid materials in the reticulo-endothelial cells of the entire body (Barr). Pick has described beautifully the skeletal lesions of these various disorders. Sosman has shown that the bone lesions particularly of xanthomatosis, respond remarkably to x-ray therapy.

The proliferative lesions of the reticulo-endothelial system conform closely in type to those of the lymphoid system (Baserga). Benign proliferations occur in many infections notably in typhoid fever, tuberculosis, syphilis and generally in the more subacute or chronic infectious processes. The peripheral blood as noted above shows a monocytosis in these conditions. Monocytic angina ("infectious monocytosis") has been described (Schittenhelm). It is interesting in this connection to note that a bacterium has been isolated ("Bacterium monocytogenes") which is capable of producing a marked monocytosis in laboratory animals (Lang).

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(Harrop and Waterfield) In the idiopathic types of this disorder, the intestines may be at fault (enterogenous cyanosis) (Jones) *Hereditary hemorrhagic telangiectasis*, although not a "blood dyscrasia" but rather a disorder of arterioles and capillaries may be mentioned here because it is at times mistaken for purpura hemorrhagica. The occurrence of blood-vessel lesions which superficially resemble petechial spots and the marked tendency to hemorrhage are the causes for this error. The reader is referred to the articles of Goldstein and Larrabee and Littman for excellent reviews of this interesting constitutional abnormality.

In conclusion, I cannot refrain from mentioning the constitutional or hereditary tendency which is particularly noticeable in diseases of the blood-forming organs. The familial tendency in pernicious anemia and combined system disease is well-known, the reviewer having observed several families in which at least two, in one case four members were afflicted with the disease. In these families, early greying of the hair and achlorhydria seem to be very common. Primary hypochromic anemia may be seen in the same family with pernicious anemia (Faber and Gram, Heath). Polycythemia vera is definitely hereditary in certain instances, and probably in many other cases if the constitutional factor is investigated. The sickle-cell trait is an hereditary familial condition as is congenital hemolytic icterus. Hemophilia is a standard hereditary disorder. Gaucher's disease and the other storage disorders of the reticulo-endothelial system are usually found in Jewish families. The reviewer has even observed typical chronic lymphatic leukemia in twin brothers, the disorder being recognized in both at about the same time, the blood cell counts were almost identical, and they died within a few months of each other.

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"lymphomata", although the tendency at present is to separate them from this group (Ewing) These reticulo endothelial tumors are composed of masses of extremely large cells with irregular cytoplasmic processes They respond readily to radiotherapy, radiosensitivity being a characteristic of all mesenchymal or blood cell tumors A generalized proliferation of histiocytes throughout the body is manifested clinically as monocytic leukemia (Vide supra.) The aleukemic form has recently been described by the author as "aleukemic reticulosis" (Dameshek)

The pathological picture of aleukemic reticulosis is characterized by generalized proliferation of histiocytes (reticular cells) with the laying-down of a great deal of reticulum Giant cells are numerous The pathological picture is in many respects closely similar to that seen in Hodgkin's disease, which is usually a disorder localized to a chain of lymph-nodes and the spleen The reviewer in the above-mentioned paper raised the question as to whether Hodgkin's disease was not in reality a relatively localized reticulum cell proliferation The proliferating cell in Hodgkin's disease does not appear to be of lymphoid origin but seems rather to be a much more primitive cell tending to differentiate into typical reticulum cells A marked reticulum with resultant fibrosis is common For these reasons, it is possible that Hodgkin's disease may be a type of reticulo-endothelioma, which if generalized, gives the picture of reticulosis Most observers now feel that the disease is definitely neoplastic in nature, although its exact relationship to tuberculosis is still uncertain Jackson and Parker have demonstrated the frequent finding of some form of tuberculosis in a large percentage of cases of Hodgkin's disease It is possible to be sure that tuberculosis by initiating an originally benign reticulo-endothelial proliferation results occasionally in the neoplastic process called Hodgkin's disease No advance in treatment has been made, x-ray treatment still being of definite value in ameliorating symptoms and possibly in prolonging life (Isaacs) Accurate diagnosis by biopsy of an accessible lymph-node should always be attempted Treatment of a mass, node, or group of nodes in the absence of a definite diagnosis of a neoplastic process of the lymph-nodes is not to be recommended except under exceptional circumstances

IV CERTAIN DISORDERS OF THE SPLEEN, THE SPLENIC ANEMIAS

The reviewer must confess very little enthusiasm for this once so important a subject In his experience, the great majority of the cases of anemia with splenomegaly, originally called Banti's disease, have turned out to be myelogenous leukemia (aleukemic), Hodgkin's disease, or cirrhosis of the liver A primary fibro-

adenitis of the spleen with leukopenia, hemorrhages from the stomach, and terminal cirrhosis of the liver, as described by Banti is apparently extremely rare (Fried, Howard and Mills) Certainly it is much rarer than one would gather from the number of cases clinically diagnosed as Banti's disease In other words, the clinical diagnosis of Banti's disease should always be taken with a grain of salt and all possible efforts made to exclude the above mentioned conditions In most cases of continued enlargement of the spleen, leukopenia is a prominent feature and there is usually a distinct anemia together with some reduction of the blood platelets This occurs in typhoid fever, malaria, cirrhosis of the liver, chronic syphilis, and in the residual splenomegaly following various infections The possible antagonism between the spleen and the bone marrow represents the rationale for splenectomy in cases of purpura hemorrhagica, aplastic anemia and congenital hemolytic icterus In the latter disorder, splenectomy also results in the removal of the largest single mass of reticulo endothelial cells In infants and children, enlargement of the spleen develops at times with astonishing rapidity, particularly with infectious processes Von Jaksch's anemia is now considered by most observers to be secondary to various infectious processes and associated with leukocytosis and splenomegaly Syphilitic splenohepatomegaly is interesting because of the marked anemia, leukopenia and thrombocytopenia present in certain cases (Stokes) Therapy of those conditions characterized by splenomegaly, hepatic involvement, anemia, and leukopenia has advanced since the insistence of surgeons particularly at the Mayo Clinic upon splenectomy as a therapeutic measure This procedure apparently aids in reestablishing normal portal circulation and thus prevents the late sequelae such as hematemesis, etc It also apparently ameliorates the anemia

V CERTAIN ASSOCIATED DISORDERS CONSTITUTIONAL OR HEREDITARY TENDENCIES

A few rare disorders which have been the occasion for some interesting papers may be mentioned in concluding this review *Acute hemato porphyria* is manifested by photosensitivity of the skin, excretion of Burgundy-wine colored urine, at times by necrosing lesions of the fingers, at times by ascending Landry's paralysis (Mason and Farnham, Courville and Mason) It is apparently a disorder of pigment metabolism, in which large amounts of hematoporphyrin (the precursor of hemoglobin) circulate in the blood-stream Another disorder of hemoglobin itself is *sulphhemoglobinemia* which, together with other closely-related conditions in which the circulating hemoglobin may be chemically altered, results in cyanosis and in insufficient oxygen carrying capacity of the blood

(Harrop and Waterfield) In the idiopathic types of this disorder, the intestines may be at fault (enterogenous cyanosis) (Jones) *Hereditary hemorrhagic telangiectasis*, although not a "blood dyscrasia" but rather a disorder of arterioles and capillaries may be mentioned here because it is at times mistaken for purpura hemorrhagica. The occurrence of blood-vessel lesions which superficially resemble petechial spots and the marked tendency to hemorrhage are the causes for this error. The reader is referred to the articles of Goldstein and Larrabee and Littman for excellent reviews of this interesting constitutional abnormality.

In conclusion, I cannot refrain from mentioning the constitutional or hereditary tendency which is particularly noticeable in diseases of the blood-forming organs. The familial tendency in pernicious anemia and combined system disease is well-known, the reviewer having observed several families in which at least two, in one case four members were afflicted with the disease. In these families, early greying of the hair and achlorhydria seem to be very common. Primary hypochromic anemia may be seen in the same family with pernicious anemia (Faber and Gram, Heath). Polycythemia vera is definitely hereditary in certain instances, and probably in many other cases if the constitutional factor is investigated. The sickle-cell trait is an hereditary familial condition as is congenital hemolytic icterus. Hemophilia is a standard hereditary disorder. Gaucher's disease and the other storage disorders of the reticulo-endothelial system are usually found in Jewish families. The reviewer has even observed typical chronic lymphatic leukemia in twin brothers, the disorder being recognized in both at about the same time, the blood cell counts were almost identical, and they died within a few months of each other.

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CASE RECORDS
of the
**MASSACHUSETTS GENERAL
HOSPITAL**

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F M PAINTER, A.B., ASSISTANT EDITOR

CASE 20101

PRESENTATION OF CASE

A fifty-one year old English housewife entered the hospital complaining of swelling of localized areas of the body of six weeks' duration.

At the age of fifteen she began to have typical attacks of bronchial asthma with wheezing, difficult inspiration and expiration, dyspnea and nocturnal orthopnea. These symptoms persisted until at the time of entry the asthma was constant the whole year round regardless of what region she was in, although it was worse at some times than at others. Morphia was begun at the onset of the disease and was used occasionally for some years. During the present attack it had been used daily in doses of one-half grain with only partial relief. Three years before entry she developed frank hemoptysis on several occasions, severe night sweats, dyspnea and orthopnea, as well as a persistent cough. She entered a hospital, where she developed marked cyanosis on exertion which had persisted. She also became aware of marked palpitation on exertion, accompanied by dull precordial pain. Six weeks before admission edema of the ankles was noticed. A short time before entry a new type of edema developed. Various parts of her body, such as the feet, legs, thighs, back, abdomen and face, swelled very rapidly at times the swelling lasting for a period of several hours. The swollen areas were red, had a tingling sensation and were quite sensitive to touch. At the same time she developed a steady non-radiating gnawing moderately severe mid-epigastric pain which was unrelieved by food or soda. There was no change in her bowel habits. For the past two months she had remained in bed. There had been no loss in weight.

Family history. Her father died of jaundice at the age of eighty-two. Her mother was living and well at eighty-four. One sister and two brothers were living and well. One sister died of appendicitis. There was no history of tuberculosis. Several members of the family had cancer.

Marital history. She had been married thirty-six years. Her husband and one daughter were living and well. She had had one miscarriage several years before entry.

Past history. She was born in England and lived there for twenty years, then in Canada for

a few years, and for the remainder of her life had lived in Vermont. She had had pneumonia several times and an attack of rheumatic fever thirty years before entry.

Physical examination showed a poorly nourished middle-aged woman lying propped up in bed, dyspneic, with an asthmatic type of breathing. She was perspiring freely. The cervical veins were distended. Her lips were moderately cyanotic. A few small cervical lymph glands were palpable. Her chest was emphysematous in shape, nearly rigid in the inspiratory position. The costal margins retracted with inspiration. The percussion note was not so hyperresonant as was expected. The breath sounds were harsh, with greatly prolonged expiration. There were many coarse moist râles, especially at the bases. The heart was moderately enlarged. The left border of dullness was 9.5 centimeters, the right 3 centimeters from the mid-sternal line. The supracardiac dullness was 6 centimeters. The sounds were not remarkable except for a tic-tac quality. The rate was 70. The blood pressure was 150/110. The abdomen was distended and tympanitic. There was tenderness without spasm in the right upper quadrant over an area of dullness taken to be an enlarged liver four fingerbreadths down, although the edge could not be felt because of tenderness. There was massive pitting edema of the legs.

The temperature was 98°. The respirations were 28.

Examination of the urine was negative. Examination of the blood showed a red cell count of 5,300,000 with a hemoglobin of 75 per cent. The white cell count was 13,500, with 88 per cent polymorphonuclears, 10 per cent lymphocytes and 2 per cent large mononuclears. The sputum was small in amount, thick, mucopurulent, and contained many partly disintegrated pus cells, no tubercle bacilli. The non-protein nitrogen was 32 milligrams. The renal function was 25 per cent at the end of fifteen minutes with a total of 40 per cent at the end of the test.

X-ray examination of the chest showed a diaphragm which was low, markedly irregular and limited in excursion. Both costophrenic angles and the right cardiophrenic angle were obliterated. There was a triangular area of dullness occupying the costovertebral angle on the right side in the region of the middle lobe. Both lung fields were grossly abnormal. There were linear and mottled areas of dullness scattered over both lung fields and in the left apex there were areas of diminished density which had the appearance of cavities. There was a large cavity which occupied the entire right apex and extended down to the arch of the aorta. There were no fluid levels seen in any of these cavities. The heart was grossly enlarged in all diameters. The supracardiac shadow was increased. The respiratory excursion of the heart

was absent. Fluoroscopic examination revealed absence of cardiac pulsations. Examination of the films brought in by the patient showed startling variation in the size of the heart. In a film taken on June 7, 1930, the heart measured 13 centimeters, 5.8 to the right and 7.2 to the left. In May 1931 the heart measured 14 centimeters, 6 to the right and 8 to the left. In June 1932 it measured 14.3 centimeters, 4.5 to the right, 9.8 to the left. In December 1932 it measured 12 centimeters, 3.7 to the right, 8.3 to the left. On June 26, 1933, it measured 16.7 centimeters, 6.3 to the right and 10.4 to the left. The only change in the lung was at the right base, and in several of the films it was difficult to determine where the right border of the heart stopped and where the pathology in the lung began.

It was believed that she had pericardial effusion and two taps were attempted, one in the fourth intercostal space 8.5 centimeters to the left of the midsternal line and another in the third intercostal space just to the right of the sternum. No fluid was obtained from either of these taps and it was felt that on both occasions the needle entered the ventricular wall. She was given moderate doses of digitalis and salyrgan without any marked diuretic effect. Her cardiac symptoms increased. Her heart rate continued to be slow until the twelfth night, when it reached 100 and cyanosis and dilatation of the veins became more marked. She died early the following morning.

DIFFERENTIAL DIAGNOSIS

DR FREDERICK T. LORD. In view of the character of the attacks we may assume that the patient has had bronchial asthma since the age of fifteen. Also I understand from this summary that she had been taking morphia for a considerable period and more recently in doses of a half grain, so I presume she had morphia addiction. The second important feature in respect to the story of the present illness is the disturbance beginning three years before admission with hemoptysis, night sweats, shortness of breath, orthopnea and persistent cough which lasted until her death. A third feature of the story is the obvious circulatory disturbance with shortness of breath, palpitation and cyanosis, and some pain, not adequately characterized, in the precordial region. In addition as a minor manifestation there was the occurrence over different parts of the body of swellings which would appear very rapidly and subside, lasting over a period of several hours. The areas were red, had a tingling sensation and were sensitive to touch. I am inclined to attribute that swelling to angioneurotic edema. The pain in the epigastrium is inadequately described. I am in-

clined to think in view of the other manifestations of circulatory failure that this pain was due to circulatory disturbance.

As far as the past history is concerned, there is a history of pneumonia on several occasions and rheumatic fever thirty years ago. We have to accept these at their face value because the manifestations are not described.

On physical examination she is said to have had an asthmatic type of breathing. I am surprised that in view of that no sibilant râles were found on examining the chest. She evidently had emphysema. The chest was "emphysematous in shape." I am not familiar with this expression. I presume it means the lung was in a state of inflation due to an excess of air, as it goes on to say that the chest was rigid in the inspiratory position.

The retraction of the costal margins with inspiration is of special interest, as under normal conditions the costal margins move away from the median line during this phase of respiration. In explanation it may be suggested that the fixation of the lung in the inspiratory phase prevents further expansion by the intercostal muscles and permits unopposed action of the diaphragm with consequent narrowing of the lower thoracic aperture. Moreover, the low fixed position of the diaphragm as seen in the x-ray would favor this, in accordance with Hoover's contention that the more nearly its curve approximates a plane the greater its mechanical advantage in control of the costal margin to which it is attached.

The examination of the heart has already been given. She had some hypertension, evidently enlarged liver, with edema.

It would be interesting in regard to the physical examination to know whether she had a Broadbent's sign. She has other indications of disturbance that might have given rise to Broadbent's sign.

In the x-ray films, in addition to the linear and mottled areas of increased density there are ring shadows with the appearance of cavities. The objection to the conclusion that these are cavities is the absence of fluid level, but in our experience both at operation and autopsy such ring shadows have often turned out to be cavities even though they show no fluid level, and I am inclined to regard them as cavities.

In view of the apparent immobility of the heart in the long axis of the body by x-ray examination, I should like to know whether it is also fixed laterally. An electrocardiogram might help to decide this, if there were lack of axis deviation of the QRS complexes on changing the patient's position.

DR WILLIAM B. BREED. There was no electrocardiogram.

DR LORD With respect to the conclusions, I make the diagnosis of bronchial asthma with some confidence because I do not think it can be refuted at autopsy. I have a similar assurance with respect to morphinism and angioneurotic edema. About the rest of the diagnosis I am not so confident. I think she had a bronchopulmonary infection. In spite of the negative sputa, in consequence of the story of hemoptysis and night sweats and the x-ray picture pulmonary tuberculosis is uppermost in my mind. One also has to consider with respect to the pulmonary situation a silicosis or asbestosis. This patient came from Vermont, but she is a housewife and so far as any evidence is concerned has never been exposed to dust. One has also to consider, I presume, a luetic disturbance. Nothing that I have in the record indicates that a complement fixation test was done, or is that an omission by design?

DR BREED I believe it was not done in this hospital, but it had been done in Vermont and was negative.

DR LORD Other causes of bronchostenosis than bronchial asthma should be considered. We are increasingly alive to the importance of this group in patients who give a history of wheezing and have sibilant râles on examination. Syphilis of the trachea and bronchi may give rise to this complex, but I think we can exclude it here. Malignant disease of the tracheobronchial tree may also be responsible, and I think we cannot exclude that here, though it is unlikely on account of the long duration of the asthma. Still another condition to be mentioned is bronchiolitis obliterans, and pressure on the bronchi from without may cause asthmatic symptoms. These disturbances are however unlikely, and it is probably asthma with superimposed infection. As to the nature of this infection, blastomycosis may be considered, but only rarely occurs without skin lesions and is hardly tenable here. I am inclined to think that the pulmonary disturbance is bronchial asthma and that the pulmonary process is tuberculosis.

With respect to the circulatory disturbance, she has heart disease and congestive failure. Whether her heart condition is rheumatic we do not know. There certainly is no evidence that it is endocarditis, although it may be. There is no evidence on physical examination that it should be so regarded. All the indications would seem to point on physical examination and x-ray to an adhesive pericarditis, and I am inclined to think that this has gone beyond mere obliteration of the cavity, which might account for the absent pulsations, but the fixation of the heart would suggest that it involves the neighborhood too, with adhesion of the pericardium to the neighborhood—the mediastinum, the pleura, the diaphragm, and possibly the chest wall.

CLINICAL DISCUSSION

DR GEORGE W. HOLMES I can add little to that very good description of the x-ray that was read, but I might point out one or two things. First, the very definite dullness at the left apex is probably due to a destructive process in this apex. Then in the lateral view the region in which the process is seen is the region of the middle lobe and it extends through into the anterior mediastinum. At least there is no normal tissue visible between the sternum and the anterior border of the heart, and that again would point to the same conclusion to which Dr Lord apparently came, that this thing might be tuberculosis of the lung with extension into the mediastinum and involvement of both the mediastinum and the pericardium.

In differentiating enlarged hearts and fluid in the pericardium the curves of the normal heart are of some value. With fluid they usually become straight lines. Then in the lateral view the space back of the heart, between the heart and the spine, is not obliterated. With fluid it usually is obliterated. So the evidence we have here is more in favor of adhesive pericarditis than it is of fluid in the pericardium, although of course there might be encapsulated fluid. If we could be sure of these cavities that would almost make the diagnosis, I think with the other evidence we have, and with cavity formation, it would be tuberculosis. These areas do resemble cavities, but I would not be absolutely certain that they are.

DR J. H. MEANS What is that perfectly round black hole behind the manubrium?

DR HOLMES It may be a cavity or an area of overexposed emphysematous lung.

DR BREED I cannot say that we had any feeling of confidence about the clinical diagnosis in this case, but I should like to say a word about our ante mortem opinion. Having seen the autopsy, I shall not talk too much about the case. We thought she had a secondary pulmonary infection with tuberculosis, and we felt that she had cavity formation on that basis. She had no Broadbent's sign. The heart sounds were not distant. I think that we should not have felt there was fluid in the pericardium except on the evidence of the x-ray in Vermont, and particularly in view of the change of the heart's size during the past three years. We did a paracentesis in an attempt to relieve some of the strain on her circulatory system as much as for diagnosis. It was a dry tap.

DR WILLIAM D. SMITH Dr Breed was good enough to ask me to see this case. I also saw the autopsy, so that my remarks will be limited.

The patient had a perfect background for emphysema heart, or cor pulmonale. There were two or three things that made me dissatisfied to stop there. In the first place her heart rate was slow, regular, not rapid (70-80), though she ob-

was absent. Fluoroscopic examination revealed absence of cardiac pulsations. Examination of the films brought in by the patient showed startling variation in the size of the heart. In a film taken on June 7, 1930, the heart measured 13 centimeters, 58 to the right and 72 to the left. In May 1931 the heart measured 14 centimeters, 6 to the right and 8 to the left. In June 1932 it measured 14.3 centimeters, 45 to the right, 98 to the left. In December 1932 it measured 12 centimeters, 37 to the right, 83 to the left. On June 26, 1933, it measured 16.7 centimeters, 63 to the right and 104 to the left. The only change in the lung was at the right base, and in several of the films it was difficult to determine where the right border of the heart stopped and where the pathology in the lung began.

It was believed that she had pericardial effusion and two taps were attempted, one in the fourth intercostal space 8.5 centimeters to the left of the midsternal line and another in the third intercostal space just to the right of the sternum. No fluid was obtained from either of these taps and it was felt that on both occasions the needle entered the ventricular wall. She was given moderate doses of digitalis and salyrgan without any marked diuretic effect. Her cardiac symptoms increased. Her heart rate continued to be slow until the twelfth night, when it reached 100 and cyanosis and dilatation of the veins became more marked. She died early the following morning.

DIFFERENTIAL DIAGNOSIS

DR FREDERICK T LORD. In view of the character of the attacks we may assume that the patient has had bronchial asthma since the age of fifteen. Also I understand from this summary that she had been taking morphia for a considerable period and more recently in doses of a half grain, so I presume she had morphia addiction. The second important feature in respect to the story of the present illness is the disturbance beginning three years before admission with hemoptysis, night sweats, shortness of breath, orthopnea and persistent cough which lasted until her death. A third feature of the story is the obvious circulatory disturbance with shortness of breath, palpitation and cyanosis, and some pain, not adequately characterized, in the precordial region. In addition as a minor manifestation there was the occurrence over different parts of the body of swellings which would appear very rapidly and subside, lasting over a period of several hours. The areas were red, had a tingling sensation and were sensitive to touch. I am inclined to attribute that swelling to angioneurotic edema. The pain in the epigastrium is inadequately described. I am in-

clined to think in view of the other manifestations of circulatory failure that this pain was due to circulatory disturbance.

As far as the past history is concerned, there is a history of pneumonia on several occasions and rheumatic fever thirty years ago. We have to accept these at their face value because the manifestations are not described.

On physical examination she is said to have had an asthmatic type of breathing. I am surprised that in view of that no sibilant râles were found on examining the chest. She evidently had emphysema. The chest was "empty sematous in shape." I am not familiar with this expression. I presume it means the lung was in a state of inflation due to an excess of air, as it goes on to say that the chest was rigid in the inspiratory position.

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DR WILLIAM B BREED. There was no electrocardiogram.

passive congestion and a moderate degree of central necrosis

The pericardial tap had punctured the ventricle and there was a very small amount of free blood in the pericardial cavity

I think this case is of very considerable interest in relation to a study of emphysema recently published by Loeschke from the University of Mannheim in Germany. Loeschke has been working on emphysema for a number of years with a very unusual technique. In every case in which he thought there was a probability of emphysema he has embalmed the body before doing the autopsy, then removed the entire thoracic cage with the lungs inside it and then made multiple frozen sections through the lungs. He studied literally hundreds of cases in that way, a type of work, needless to say, that it would be impossible to do in this country. As a result of that work he has come to the conclusion that the most important etiologic factor in emphysema is the spatial readjustment within the thorax. The commonest type is an antero-posterior enlargement of the thorax generally from kyphosis, with compensatory anterior and upward motion of the sternum. He shows in his publication pictures of innumerable thoraces with kyphosis of various levels and scoliosis of various degrees, and shows that in the portions of the chest that would be enlarged by the deformity emphysema is present, in the opposing portions there is no emphysema.

Another mode of pathogenesis fitting the same theory is the spatial readjustment within the thorax when large groups of alveoli are completely destroyed and collapsed. The neighboring alveoli about the scarred area are forced to dilate to fill up the space.

Scattered throughout every lobe of both these lungs we have innumerable scars varying from a millimeter to a centimeter in size which are made up of collapsed alveoli, sometimes ten or fifteen, sometimes one hundred or two hundred, all compressed down to a diameter of less than a centimeter. The corresponding dilatation in the surrounding alveoli is exactly that which Loeschke predicts and which he believes is the main cause of emphysema.

It is interesting that one of the standard theories of emphysema is a loss of elastic tissue in the lungs, and I have never seen so much demonstrable elastic tissue as there was in this case. Even in the walls of the emphysematous alveoli there is a large number of elastic fibrils. Loeschke has also found the same thing and feels that the elastic tissue is by and large the most resistant structure of the alveolar wall, that all other elements of the alveolar wall disappear before the elastic tissue does.

Of course this patient had asthma, and one might assume that the emphysema was due to the asthma. We have now nearly twenty cases

of known asthma coming to autopsy in this hospital and this is the first one that has shown a significant grade of emphysema. Loeschke, working back from emphysema, came to the same conclusion, that bronchial asthma alone without other pulmonary complications was in itself a very unimportant cause, if ever a cause of emphysema.

DR. LORD: I should like to know about the pericardium.

DR. MALLORY: Except for the hemopericardium it was entirely negative. I have no explanation for the variation in the size of the heart or for the lack of pulsation of the various chambers.

DR. HOLMES: The movements of the heart may have been obscured by the limitation of the diaphragm.

About those emphysematous blebs, when I hear the term bleb I think of something on the surface. They were not on the surface too, were they?

DR. MALLORY: They were on the surface and internal. The largest ones were on the surface.

DR. HOLMES: Some of them were actually cavities within the lung?

DR. MALLORY: Yes.

A PHYSICIAN: Was there much sclerosis of the pulmonary artery to cause the enlargement of the veins in the neck?

DR. MALLORY: The main pulmonary artery was not greatly involved. The smaller ones showed a marked degree of sclerosis, but it is just as probable that the sclerosis and the right heart failure were both secondary to the same lesion.

DR. BREED: I take it that this shadow under the sternum in the x-ray film might be one of the emphysematous blebs with the cavity there.

DR. HOLMES: It is possible, but I should not feel certain.

CASE 20102

PRESENTATION OF CASE

DR. CHARLES F. WARREN: * This is the case of a married Italian laborer who came to the Outpatient Department first at the age of twenty-seven, a year and a half before his admission to the wards, and gave the following history.

For two years previously he had been intermittently employed mixing silica dust and liquid soap in the manufacture of abrasive soap. Four months before the visit he had had to give up work for two months on account of dyspnea and pain in his chest. He got no worse and was able to go back to work two months later, but had dyspnea and pain more frequently. Two days before the visit he was again unable to continue because of the dyspnea and chest pain. Physical examination at that time was

Recently senior interne on the West Medical Service

viously had congestive failure with signs of extreme venous congestion. Furthermore, on physical examination she had a heart that was very, very big, and while one can have a big heart in cor pulmonale, I have not been in the habit of seeing them as huge as this one.

In the next place, if this was a dilated heart due to back pressure and failure, and if the heart was so big because it was dilated, then it was extraordinary that she should have a relatively slow and regular heart rate, and it was a little queer that there was no murmur, nothing to suggest tricuspid insufficiency due to a dilated right heart. Also, her neck veins were strikingly congested. They stood out like cords. All this made me unwilling to stop at pulmonary heart disease and I felt that she probably had adhesive pericarditis, possibly mediastinopericarditis. She had also, presumably tuberculosis. I did not think for a moment on physical examination that she had pericardial effusion, but after talking with the x-ray people and looking at the films I admitted that she might have pericardial effusion and was willing to have an attempt made at paracentesis, but Dr. Breed and I both agreed that there was nothing on physical examination to suggest that she had a pericardial effusion.

DR MEANS Because of these features which Dr. Smith has just mentioned, I should like to suggest the remote possibility of a terminal thrombosis of the pulmonary artery. They bear some resemblance to the case, Dr. Mallory, that you and I had three or four years ago.

DR DONALD S. KING Did she have a history of epidemic influenza?

DR SMITH I think not.

DR KING Some men recently have said that these pulmonary fibroses follow epidemic influenza. I have been looking for cases and have not found them. I thought perhaps this might be one.

DR BREED I was sure she did not have rheumatic heart disease.

DR SMITH I should agree to that. There was not a particle of evidence of mitral stenosis or of any rheumatic heart disease.

A PHYSICIAN How much temperature did she have?

DR BREED None.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Tuberculosis of lungs, pleura and pericardium

DR. FREDERICK T. LORD'S DIAGNOSES

Bronchial asthma
Pulmonary emphysema
Pulmonary tuberculosis
Bronchopulmonary infection
Adhesive pericarditis

ANATOMIC DIAGNOSES

(Bronchial asthma)
Pulmonary emphysema
Organized bronchopneumonia, multiple foci
Pulmonary arteriosclerosis
Cor pulmonale
Puncture wounds of the heart
Hemopericardium
Hydrothorax, bilateral
Ascites
Central necrosis of the liver
Kyphosis, slight
Chronic fibrous pleuritis

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY The autopsy was somewhat of a surprise because no tuberculosis whatever was found and the very large cavities turned out to be emphysematous sacs the largest of which was five centimeters in diameter. The intervening lung tissue between the emphysematous areas showed a marked degree of fibrosis of a very peculiar character so that the huge emphysematous blebs surrounded by fibrous walls gave a picture that proved indistinguishable from tuberculous cavities.

The sections are very interesting. This first section is an eosin methylene blue stain of an area of marked fibrosis. With this stain you can see nothing but fibrous scarring and can get no idea how it occurred. With the elastic tissue stain it becomes much more evident how this has been brought about. Here is one of those fibrous areas, a small one, one centimeter in size which is made up of fifty or more alveoli completely collapsed, and fused together by fibrous tissue, but the elastic tissue of the original alveolar walls persists and allows us to make out their outline. In the neighborhood of the scars we get the most marked emphysematous lesions, for the most part with thin walls, but in other places showing very thick walls. Everywhere the pulmonary arteries show a marked degree of sclerosis. The majority of the bronchi show a certain amount of plugging with mucus and a definite narrowing of the lumina and thickening of the musculature, all typical asthma. The distribution of the emphysema varies in the different lobes. It was most marked in the two upper ones, but some emphysema was present in every lobe.

DR. BREED Will you say a word about the size of the heart wall, particularly of the right ventricle?

DR. MALLORY The heart was hypertrophied, weighing 400 grams. The left ventricular wall was normal or a little reduced in size. The right measured 14 millimeters, as against a left of 16 millimeters. The right side was practically as large as the left, between three and four-fold hypertrophy.

The liver was not enlarged, but showed a slight

diagnosis of silicosis The x-ray showed diffuse density but no areas of consolidation The right side of the heart from the midline to the right border was out 5.3 centimeters We interpreted that as showing right-sided cardiac enlargement due to resistance in the pulmonary vascular bed A clinical diagnosis of silicosis was made, and we followed him for eighteen months, to the time of his death

DR TRACY B MALLORY What was the interval between the last exposure in the factory and the time of death?

DR CHAPMAN He had been exposed for twenty-nine months in the industry The last time he was exposed in the industry was, I believe, twenty-two months before entry He went back to work after that, but had an ordinary job without exposure to silica dust

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Silicosis

Bronchopneumonia

ANATOMIC DIAGNOSES

Acute pulmonary silicosis

Silicosis of bronchial, mesenteric and retroperitoneal glands

Pulmonary edema

Acute purulent tracheitis and bronchitis

Cardiac dilatation and hypertrophy, right, very slight

Hydropericardium

Splenomegaly

Hepatomegaly

Tuberculosis (?) of splenic glands

Chronic fibrous pleuritis

Chronic cholecystitis

Cortical adenoma of adrenal

PATHOLOGIC DISCUSSION

DR MALLORY One of the interesting features of the case is that pathologically this seems to be a very acute lesion in spite of the interval since the last exposure In other words we seem to be dealing with a toxin which continues to acutely progressive injury for extraordinary periods of time after it has once been absorbed into the body

I have two pairs of lungs here which are rather large to pass around, but I hope you will look at them as you go out These on my right are from the first case we autopsied here and show a more chronic type of process than today's case does They show peculiar deep scars which seem to divide the lung into a score of lobes much as the scars of healed gummata produce the hepar lobatum of syphilis In today's case there is practically none of that deep scarring Instead we have a diffuse induration, fairly uniform throughout both lungs, though most marked in the lower lobes, where the con-

sistency is practically that of leather The diffuse fibrosis was so marked that the milary nodules usually found in silicosis could not be made out grossly, though microscopically we have been able to find typical ones

I will show you first a section from the older case, the one in which the process is more finished In this you can see that the interlobar septa, which in a perfectly normal lung are so thin that they may readily be overlooked, are here very broad, dense and the most obvious thing in the section In the midst of these broad bands of fibrous tissue are round spherical masses which stain bright pink, entirely free from nuclei, and apparently consisting only of collagen in which are imbedded minute doubly refractile silica granules Those are the milary silicotic nodules which are characteristic of the disease They tend to be most numerous in the lymphatics, and mechanical blocking of the lymphatics may become a factor in the pulmonary edema which often develops

This section is from today's case and shows the same thickening of the interlobular septum, not quite so marked as in the preceding case but nevertheless very definite There are very few of the spherical masses In this case there is considerable hyperplasia of the lymphoid tissue, probably an actual new formation of lymph nodules well out in the periphery of the lung The most striking feature of this lung is the presence in every alveolus of large amounts of pink staining fluid, an extreme grade of edema apparently with a very high protein content Another interesting finding is the presence of epithelium in all the alveoli Normally no epithelium can be seen in the lungs Some people have even doubted its existence In this case almost every alveolus shows a definite low cuboidal epithelial lining Sometimes it is stripped off the walls and hangs in little festoons in the lumen of the alveolus

The process, as usual, extended beyond the lungs to the lymph nodes, and they contained the characteristic silicotic nodules in much greater numbers than the lung itself These lesions are often extremely difficult to distinguish from healed milary tubercles, but only in a few nodes from the splenic pedicle did we find a few lesions genuinely suggestive of tuberculosis

A PHYSICIAN Had he a big spleen?

DR MALLORY The spleen was enlarged, and in the corpuscles there was marked fibrosis Whether that was an integral part of the process I do not know, because one sees it very frequently in other lesions

A PHYSICIAN Were there any silicotic nodules in the bone marrow?

DR MALLORY No The marrow shows only hyperplasia

essentially normal except for the fact that his respirations were 27 and he had some scattered areas of dullness in his chest. Expansion of the chest was poor, and at the left base there was some decrease in tactile fremitus and in breath sounds. Dr E M Chapman saw him at that time and immediately started him on ammonium chloride and advised him to discontinue his work. Clubbed fingers were noted at a second examination three weeks later, otherwise the findings were the same as before. A series of chest x-rays was taken at that time.

He got along fairly well at home for seventeen months except that he had a marked tendency to upper respiratory infections accompanied by dyspnea and cyanosis and some chest pain. He also had a markedly diminished vital capacity. Five weeks before his entry to the wards he suddenly caught cold, as he said, with increase of all the symptoms he had had previously. There was no fever at that time, but he was put to bed. Two weeks before entry he began to run a fever said to be 99° to 102.4° , usually more marked in the afternoon. One week before he came in he had a sudden attack of marked dyspnea and cyanosis which lasted until his doctor gave him a hypodermic injection six hours after the onset. He was advised to come into the hospital then, but he did not do so until he had a second attack on the day of entry, persisting until it was relieved by two hypodermic injections. He finally made up his mind to come to the Emergency Ward.

When he was seen there he was in marked respiratory distress, and extremely cyanotic. The neck veins were very full and distended. There were moist râles throughout both chests, with dullness, bronchial breathing, egophony, increased tactile fremitus, and friction rub over the right lower chest. The heart was not remarkable except for its somewhat globular shape. The blood pressure was 120/80, the temperature 104° , the pulse 170, the respirations about 45.

Because of his extremely poor condition he was immediately placed in an oxygen tent. We were able to group a pneumococcus type IV from his sputum, but his white blood cell count was only 12,500. After spending the night in an oxygen tent, the next morning his temperature was normal, his pulse 92 and his respirations 27. He continued to improve a little for a few days. On the sixth day he reached probably his maximum period of well-being, when he was out of the oxygen tent for six hours. After that when he was out of the tent for an hour his temperature would go to 101° or 102° and his respirations increased. The story from this period until death on the 23rd day was one of less and less ability to be out of the oxygen tent. Finally he required an increasing amount of oxygen saturation in the tent to keep him comfortable. He developed some edema of the ankles and some pleuritic pain on the left side. The signs of consolidation at the right base cleared up, but

there remained dullness and scattered râles throughout the chest without the definite consolidation that he had at entry. His red blood count was 3,900,000, his hemoglobin 70, his Hinton test negative. His white blood cell count was usually 9000 to 10,000. We were never able to discover any tubercle bacilli in the sputum. There seemed to be at his weakest no change in pulse and respirations so long as he was kept in the oxygen tent. He died rather suddenly in his sleep.

CLINICAL DISCUSSION

DR AUBREY O HAMPTON. At the first x-ray examination at the time of his first visit to the Outpatient Department we thought he did not have the characteristic appearance of ordinary silicosis, that is, he did not have small milary nodules scattered over the periphery of the lungs. He had only thickened lung tissue. In the films taken two months, five months and a year later there is no definite change that we can see, although the x-ray exposure necessary to penetrate the lung tissue had penetrated the heart and shows the vertebrae. Even with an x-ray exposure of this type the lungs still look as though there was not enough air or as though it had been replaced by edema. I think that given a patient with edema elsewhere I should be perfectly content with calling this picture edema and increase in pulmonary pressure. The only definite evidence we had of fibrosis was the adherent diaphragm.

In this picture taken at the time he entered the wards, however, the findings are almost identical with those of the other men who died of the same disease. We could not see any aerated lung at all in the middle and lower portions of the lung. The whole lung picture was that of diminished air content without any definite lines. That is the last examination.

DR WARREN. An investigation three weeks after his first visit to the Outpatient Department disclosed that five out of six similar cases in men who had been doing the same kind of work in the same plant had ended in death from acute silicosis.

The discharge diagnosis was primary silicosis. I believe he may or may not have had pneumonia before or when he came in, but that seemed to disappear before he died.

DR EARLE M CHAPMAN. This case is the third one we have followed and the second one in which we obtained autopsy findings of silicosis. All cases had been observed in the industry of making a cleanser which is silica mixed with soap. The disease in this case was quite acute, in contrast to the usual slowly progressing ones we see. The reason for this probably is that the alkaline mixture of the soap hastens the reaction of fibrosis in the lungs.

It is interesting that at the time of his first x-ray examination they were unable to make a

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CANCER OF THE PROSTATE

In this issue of the *Journal* appears a significant contribution by Doctor Frederick L. Hoffman on Cancer of the Prostate and Prostatic Diseases. The significance of this article lies not only in the figures showing the increase of deaths from these causes (an increase which may be more apparent than real), but in the fact that the importance of prostatic cancer is recognized by some one who is not a urologist.

As with cancer elsewhere in the body, the successful treatment of cancer of the prostate depends largely upon early recognition of the condition. Like cancer of the stomach, prostatic cancer often gives no symptoms until it has progressed to a stage where treatment can be only palliative. The symptoms most commonly encountered may be divided into two classes—pain caused by extension of the growth along the pelvic lymphatics or by metastases to the spine and symptoms due to bladder dysfunction. These latter may be due to urinary

obstruction alone or to obstruction plus infection. Not infrequently there are no local symptoms at all the patient becomes cachectic and even uremic without having suffered any pain. In the large majority of cases, cancer of the prostate is of relatively slow growth, it seems probable that the disease frequently exists in a recognizable state for several years before causing symptoms severe enough to lead the patient to consult a doctor.

The obvious conclusion to be drawn from these observations is that palpation of the prostate by rectum should constitute a part of every physical examination in men of fifty or over. If this were done routinely, many cases of prostatic cancer (and rectal as well) would be detected early, or at least much earlier than would be the case if such examinations were postponed until definite prostatic symptoms occurred. The stony hardness of the malignant prostate is striking, any gland presenting an unyielding, hard structure should be suspected of malignancy. Such prostates may be smaller than the average gland, the cancerous prostate is often not obstructive until a late stage, unless the condition is accompanied, as it frequently is, by hypertrophy.

Unfortunately there exists a strong feeling of pessimism as to the value of treatment in this disease. Many physicians choose to follow a laissez faire policy in these cases believing that this is the best that can be done. It is true that the number of cases of prostatic cancer that have been cured is pitifully small but this is largely due to the fact that the patient does not come to the surgeon until his disease is far advanced. If women with cancer of the breast were not operated upon until the axillary glands were thoroughly infiltrated with growth, the percentage of cures would be extremely low.

Radical removal of the prostate and vesicles in the earlier cases, and in the more advanced cases prostatic resection plus radiation, offer great relief from suffering and an occasional check to the growth which is the next thing to a cure. Every year of comfort added to the life of the patient with prostatic cancer is worth fighting for.

Let us hope that Doctor Hoffman's article will be widely read, and will be the beginning of a campaign against a disease which causes extreme suffering and a lingering illness and is apparently increasing in prevalence.

COORDINATED VOLUNTARY HEALTH WORK

THE National Health Council held its annual meeting at the Hotel Roosevelt New York City, February 28, 1934, and elected Colonel Theodore Roosevelt, former Governor General of the Philippines, president.

A PHYSICIAN Do you think the cyanosis was due to thickening of that alveolar lining?

DR MALLORY It may have been due to that. I think the extraordinarily uniform edema perhaps is a little more apt to be the cause of it. He must have had edema nearly as marked as this for months before he died. I am rather inclined to think that the appearance of the epithelial lining is secondary to that. One does see epithelial lining of this type appear under conditions where the lungs lose their aerating function, for instance in organizing pneumonia.

DR WYMAN RICHARDSON I think the man's temperature chart is interesting. Although in heart failure there is often a fever, it is not so marked as in this case.

DR MALLORY I must admit that I do not know of any other condition to bolster up the theory that anoxemia may cause hyperthermia, and yet this case strongly suggests it in the way the chart jogs up and down with each deprivation of oxygen.

DR CHAPMAN The fever in congestive failure is accounted for by lessened peripheral heat loss from the sluggish circulation.

DR MALLORY In this man the heart weighed 300 grams, which I think is just about normal for his weight of 140 pounds. The right ventricle wall did appear relatively thick, 6 millimeters against a normal of about 3.5 millimeters. I think he had some degree of right hypertrophy.

sultant in Surgery Dr Howard will continue as professor of surgery of the Boston University School of Medicine

Dr Wiggin served in the World War as captain in the Medical Corps with the unit sent to France by the Memorial Hospitals

UNWARRANTED CURATIVE CLAIMS

"If you suffer from influenza, bronchitis, malaria stomach complaints, and certain other diseases do not trust to whisky in the treatment of your illness" says Dr F J Cullen of the Federal Food and Drug Administration "Whisky has some value," says Dr Cullen, "as a stimulant to the appetite and as a general stimulant, but it has no use in the cure or treatment of any disease"

Recently the Government seized 499 cases of 'Old Grand-dad' whisky, shipped by the American Medicinal Spirits Co., Inc., Louisville, Ky., to the firm's place of business in Chicago, Ill. The whisky was grossly misbranded with remedial claims for a number of diseases including pulmonary conditions stomach complaints, la grippe, 'typhoid and other low fevers' The label went on to say that the whisky could also be used to render the system immune from various diseases and externally for ulcers

Another recent seizure initiated by the Food and Drug Administration removed from the market several hundred bottles of 'Old Nectar' whisky which was labeled with remedial claims for bronchitis, influenza, and other maladies The whisky was shipped from a New York City warehouse to a Baltimore branch of the firm. The Government charged that the whisky was falsely and fraudulently labeled as to its curative claims and that additionally it did not comply with the requirements of the United States Pharmacopoeia.

Recently Dr Cullen states the Federal court for the northern district of Illinois assessed a fine of \$100 upon Fridolin Pabst, trading as Pabst Chemical Company Chicago Ill., for shipping in interstate trade a nostrum known as 'Pabst's Okay Specific'. The preparation contained no ingredients which, according to medical opinion, would be effectual in the cure of gonorrhea and gleet yet the circulars accompanying the article made curative claims with regard to these diseases The medicine was misbranded in that the labels on the bottles bore false and fraudulent claims as to the remedial nature of the goods Quantities of 'Pabst's Okay Specific' were shipped to Beaumont Texas and San Juan, Puerto Rico The Government had previously seized the goods

The recent prosecution of Pabst was not the first one. Several years ago he was fined for a similar offense In the recent case the court stated that if

the defendant, who pleaded guilty, committed another such violation of the Federal food and drugs act, the court would be disposed to impose a jail sentence

"Persons suffering from a venereal disease should immediately seek competent medical advice as to the treatment of the disease" states Dr Cullen. "There are free clinics in all cities for the treatment of those unable to pay Sufferers should not rely upon the advertised claims of charlatans who have worthless nostrums to sell. Nor should they be misled by false and fraudulent label claims for the goods nor by assertions made in circulars which commonly accompany these preparations During the 27 years of enforcement of the national pure food and drug law, the government has seized large numbers of drug preparations falsely recommended as being worthwhile treatments or cures for venereal diseases"—*Bulletin, U S Dept of Agriculture*

CORRESPONDENCE

'VITAMIN D MILK IN THE TREATMENT OF INFANTILE RICKETS'

February 28, 1934

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- 3 The apparent discrepancy between the minimal clinically effective dose of vitamin D in the form of vitamin D milk and in the form of cod liver oil or viosterol requires further investigation.

These conclusions were based upon a study carried out in infants that were hospitalized throughout the entire period of observation. They were kept in a room from which actinic rays of the sun were excluded, by keeping the windows closed and the shades drawn. The rooms were freely aerated at night Each child was observed for a control period of two to three weeks to rule out spontaneous healing from accidental treatment received previous to admission to the hospital As further controls some children were fed vitamin D milk while others were given equal amounts of plain milk.

As Dr Hess has pointed out in his letter we do not question the effectiveness of irradiated milk, but

The Council is composed of seventeen national health organizations, and, according to the statement in the *New York Times*, has for its general purpose the prevention of disease by acting as a clearing house for member organizations, unifying health education procedure, preventing duplication of work, and developing economies of administration.

Colonel Roosevelt will enter upon his duties immediately. He explained that all of the member health groups are working toward a common end although the specific object of each may seem to be different. He felt that great service will be rendered, and advances made if the work of the member groups can be coordinated. He believes that each one, for example the child health, the mental hygiene, the tuberculosis, the cancer, the heart, and all the rest of the groups, may conduct surveys simultaneously, and take on coordinated teamwork which will be outside of government activities. Although he recognizes the necessity of government work in crises, the opinion was expressed that if more is done by voluntary agencies, and less by the government, the general result will be more satisfactory. This we believe to be sound because the effect will be a more general interest in health problems by the people, and a growing feeling of individual and community responsibility. It may be that the progress in the tuberculosis and cancer campaigns has been rapid because of the awakened interest of the masses in these movements. Where the interest of the great majority of the people can be aroused in any matter of personal concern, confidence in scientific medicine seems to advance. This office of Colonel Roosevelt carries no compensation, and it is gratifying to have this intelligent layman take this important position.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

HOFFMAN, FREDERICK L. LL.D. Tulane University 1911. Consulting Statistician, Prudential Insurance Co. Member, American Cancer Research Association. Director, American Society for the Control of Cancer. His subject is "Cancer of the Prostate and Prostatic Diseases." Page 507. Address 133 South 36th Street, Philadelphia, Pennsylvania.

MCCANN, JAMES C. A.B., Ph.D., M.D. Harvard University Medical School 1924. F.A.C.S. Surgeon, St. Vincent Hospital, Worcester. His subject is "Peptic Ulcer. Its Surgical Management." Page 512. Address 390 Main Street, Worcester, Massachusetts.

CONWELL, H. EARLE. M.D. University of Alabama School of Medicine 1915. F.A.C.S. Or-

thopedic Surgeon, Employees' Hospital of Tennessee Coal, Iron & Railroad Company, Fairfield, Alabama. His subject is "Some Problems Frequently Encountered in the Treatment of Recent Fractures." Page 522. Address Tennessee Coal, Iron & Railroad Company, Employees' Hospital, Fairfield, Alabama.

BIGELOW, GEORGE H. A.B., M.D. Harvard University Medical School 1916. Formerly, Massachusetts State Commissioner of Public Health. Now Director, Massachusetts General Hospital. Address Massachusetts General Hospital, Boston, Massachusetts. Associated with him is

LOMBARD, HERBERT L. A.B., M.P.H., M.D. Bowdoin Medical School 1915. Director, Division of Adult Hygiene, Massachusetts Department of Public Health. Address 100 Nashua Street (10th Floor) Boston, Massachusetts. Then subject is "Change in the Massachusetts Cancer Trend." Page 526.

BARTON, WALTER E. B.S., M.D. University of Illinois College of Medicine 1931. Assistant Physician, Medical Service, Worcester State Hospital. Address Worcester State Hospital, Worcester, Massachusetts. Associated with him is

FREEMAN, WILLIAM B. Ch.E., D.N.B., M.D. Boston University School of Medicine 1929. Pathologist at the Worcester State Hospital, and the Worcester Hahnemann Hospital, Worcester, Massachusetts. Assistant in Pathology, Boston University School of Medicine. Consulting Pathologist, Stephen Henry Gale Hospital, Haverhill, Massachusetts and Nantucket Cottage Hospital, Nantucket, Massachusetts. Address P.O. Box 489, Worcester, Massachusetts. Their subject is "Pericardial Hemorrhage Complicating Scurvy." Page 529.

DAMESHEK, WILLIAM. M.D. Harvard University Medical School 1923. Associate Physician, Beth Israel Hospital. Physician, Research Division of the Boston State Hospital. Physician, Boston Dispensary. Physician to the Blood Clinics of the Beth Israel Hospital and Boston Dispensary. Instructor in Medicine, Tufts College Medical School. His subject is "Progress in Hematology (1929-1933)." Page 531. Address 371 Commonwealth Avenue, Boston, Massachusetts.

MISCELLANY

THE APPOINTMENT OF DR. R. C. WIGGIN

At the recent meeting of the Massachusetts Memorial Hospitals Dr. Ralph C. Wiggin was appointed Surgeon in Chief to the Hospitals.

Dr. Charles P. Howard has resigned this position after thirty six years of service, but will act as Con-

sultant in Surgery Dr Howard will continue as professor of surgery of the Boston University School of Medicine

Dr Wiggin served in the World War as captain in the Medical Corps with the unit sent to France by the Memorial Hospitals

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As Dr Hess has pointed out in his letter we do not question the effectiveness of irradiated milk, but

we do question the right of Dr Hess and his collaborators to draw conclusions as to the relative effectiveness of irradiated milk and milk produced by yeast feeding, without testing the two milks, side by side, at the same levels. We feel that we have carried out such a study.

Dr Hess maintains that it is impossible to draw even tentative conclusions from our work because the observations were made during the months of April, May and June, and in one instance, even extended into the first week of July. We agree most heartily that clinical studies such as those carried out by Hess and Lewis, in which patients remain at home, under such supervision and control as can be given by visiting nurses, should be discontinued about the end of March, in order to avoid the possibility of spontaneous healing. After that time such children are almost certain to get healing amounts of sunshine. In studies such as ours, however, in which all patients are hospitalized, this need for discontinuance disappears. With the preliminary observation period each child serves as its own "untreated control" to rule out the possibility of healing as the result of previous exposure to sunlight or other inadvertent antirachitic medication.

The presence of our two "untreated controls" which were discarded because of spontaneous healing, might cast doubt upon the value of our treated cases if it were not for the fact that each treated case served as its own "untreated control." Because of this the "untreated controls" merely emphasize the importance of the preliminary observation period.

Dr Hess insists that an adequate demonstration of the relative potency of the two forms of vitamin D milk requires not only that the two forms of vitamin D milk be fed over an equal period of time and at the same level, but also that they be fed simultaneously at a level of vitamin D which just suffices to bring about healing within a definite period and in addition, at one which just fails to produce healing. He points out that such a study is reported by Hess and Lewis in an article which appeared in the *J. A. M. A.* of July 15, 1933. In the interest of justice, I desire to state that our paper was complete and had been submitted for publication before the appearance of Dr Hess's paper, and that I was abroad at the time and did not see the article until the latter part of August.

A careful analysis of the data given in their paper fails to show that the conditions stated by Drs Hess and Lewis themselves, have been complied with. Yeast milk was fed at a level of 60 units per day and evidence of healing appeared in all but one child at the end of four weeks, and in this child healing appeared at the end of six weeks. One may seriously question whether 60 units of vitamin D in the form of yeast milk does represent a 'minimal level.' In their paper of July 15, 1933, Hess and Lewis stressed the fact that the milk which was fed to the children was repeatedly assayed for its vitamin D content. Unfortunately, this cannot be said of the milk used in previous studies by Hess and his collaborators.

Hess, Lewis, MacLeod and Thomas, in a table given in their paper, show that when 60,000 units of vitamin D are fed to cows daily, in the form of irradiated yeast, the milk secreted contains approximately 160 units of vitamin D to the liter. Dr C. A. Smith, who has had a very extensive experience in feeding irradiated yeast to cattle, informs me that it requires at least 110,000 to 130,000 units of vitamin D in the form of irradiated yeast to yield milk which contains approximately 160 units to the liter, when cows are producing 30 to 40 pounds of milk daily. This would seem to indicate that the milk which Dr Hess fed in experiments previous to the paper of July 15, 1933, was probably weaker than he calculated. This suspicion is justified by the statement of Drs. Hess and Lewis in their report of July 15, 1933, in which they state, "In our previous experiments assays were not carried out on the identical preparations, which were given to the infants." Thus, it would seem that their early cures were obtained with milk poorer in vitamin D than they calculated.

We obtained definite healing with 40 units of Vitamin D in the form of yeast milk, and it is not unlikely that even this does not represent the "minimal dose." Drs Hess and Lewis in their paper of August 20th, state that for an exact comparison of the two milks, a study in which the two types of therapy are carried out at the same time and under similar conditions, is necessary. We believe that we have followed their specifications more carefully than they did themselves. We also feel very strongly that the controls were of such a nature as to exclude completely any beneficial effect upon the rachitic condition other than that which was due to the vitamin D milk itself. Similar studies carried out during the winter months are desirable and are being carried out now.

Sincerely yours,

BENJAMIN KRAMER, M.D.

OBITUARY

RESOLUTIONS ON THE DEATH OF DR. JEREMIAH J. CORBETT ADOPTED BY THE NEW ENGLAND PHYSICAL THERAPY SOCIETY

Dr Jeremiah J. Corbett was born in Peabody, Massachusetts, on August 28, 1877. He died in Santa Fe, New Mexico, on August 24, 1933, while on a vacation trip.

He was educated in the public schools of Peabody and at St. Francis Xavier's College, receiving his medical degree from the Harvard Medical School in 1906.

He specialized in diseases of the eye, ear, nose and throat and was, at the time of his death, Ophthalmic Surgeon in Chief of the Boston City Hospital, Surgeon in Chief, Eye, Ear, Nose and Throat Department of the Malden Hospital, and Consulting Ophthalmic and Aural Surgeon, Whidden Memorial Hospital, Everett.

He was a charter member of the New England

Physical Therapy Society. Other medical societies of which he was a member included the American College of Surgeons, American Medical Association, American Academy of Ophthalmology and Otolaryngology, New England Ophthalmological Society, New England Otological and Laryngological Society, the Massachusetts Medical Society and the Malden Medical Society.

He was an interested attendant at the meetings of our Society and took a prominent part in the discussions particularly when subjects were presented which related to his specialty in medicine. He contributed much by his knowledge of the scientific application of physical therapy in the realm of his specialization and applied these principles of treatment in many of his cases. He also showed his appreciation of the value of these measures of treatment by referring cases to physicians specializing in physical medicine. His writings on these subjects have been of value.

Be it resolved that in the passing of Dr. Jeremiah J. Corbett, the New England Physical Therapy Society has lost a member who, by his high character, his scholarly attainments, his kindness, his spirit of coöperation and his knowledge of physical measures of treatment, was, from its inception, one of its most valued Fellows.

To his bereaved widow and son, we extend our sincerest sympathy.

Be it further resolved that a copy of these resolutions be sent to his immediate family to the *New England Journal of Medicine* and that a copy be spread upon the records of the New England Physical Therapy Society.

WILLIAM D. McFEE, M.D.,
Committee on Resolutions

RECENT DEATHS

CHURCHILL—JOHN DARLING CHURCHILL, M.D., of 63 Court Street, Plymouth, Massachusetts died at the Jordan Hospital, Plymouth, March 2, 1934.

Dr. Churchill was born in Minneapolis in 1874 the son of Frederick Lee Churchill and Mary Diman Churchill, both of whom were formerly of Plymouth. After graduating from Harvard College he entered the Harvard Medical School and was awarded his medical degree in 1900 and joined the Massachusetts Medical Society in 1906. After graduating in medicine he practiced in Wyoming and Oklahoma for a few years before settling in Plymouth. He had served as physician to the Plymouth county jail for more than thirty years.

He is survived by his mother, his widow, Elizabeth Churchill, a son, Frederick, a sister, Mrs. Thomas L. Small, and a brother, Gilman Churchill.

CARVILL—LIZZIE MAUD CARVILL, M.D. of Somerville, Massachusetts, with an office at 82 Commonwealth Avenue, Boston, died at her home, February 25, 1934.

Dr. Carvill was born at Lewiston, Maine, in 1873. She was educated at the Chauncy Hall School, Boston, and Tufts College and graduated in medicine from the Tufts College Medical School in 1905.

She carried on a general practice for several years, and then devoted herself to ophthalmology. She joined the Massachusetts Medical Society in 1905, and was also a Fellow of the American Medical Association. She was a member of the New England Ophthalmological Society, and served on the staff of the Massachusetts Eye and Ear Infirmary.

She is survived by a brother, Sewall A. Carvill of Somerville, and two nephews.

NOTICE

RADIO HEALTH MESSAGES

MARCH, 1934

Sponsorship: Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.

Courtesy WBZ. Fridays, 4:30 P.M.

March

16 Fractures

23 How to Keep the Well Child Well

30 Résumé of the Year's Work

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health. Fridays, 4:40 P.M.

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEL. Fridays, 5:00 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

SPECIAL

Courtesy WEEL. Fridays, 1:15 P.M.

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health, Blended with Classical Music.

REPORTS AND NOTICES OF MEETINGS

MASSACHUSETTS GENERAL HOSPITAL CLINICAL STAFF MEETING

The clinical staff of the Massachusetts General Hospital held its February meeting in the Moseley Memorial Building on Thursday, February 15, at 8:15 P.M. Dr. C. Langdon Parsons was chairman of the meeting.

The meeting opened with the presentation of an unusual case of cholelithiasis in a 63-year-old housewife who had entered the hospital complaining of

we do question the right of Dr Hess and his collaborators to draw conclusions as to the relative effectiveness of irradiated milk and milk produced by yeast feeding, without testing the two milks, side by side, at the same levels. We feel that we have carried out such a study.

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He was a charter member of the New England

The New England Journal of Medicine

VOLUME 210

MARCH 15, 1934

NUMBER 11

DENTAL HEALTH A PROBLEM IN NUTRITION*

BY JOSEPH GARLAND, M.D.†

AN attempt at bringing to a group of clinicians and investigators in the dental sciences any significant message as to the development of the teeth, the factors which determine their occlusion and their continued integrity, the influences which bear upon their health and their diseases, would seem too much I am afraid like carrying coals to Newcastle. Rather should we in the kindred science of medicine, and particularly in pediatrics, who are searching for means to preserve general health, sit at the feet of the dental profession and learn what it has to teach us. Nevertheless the problem of dental health is with us, it is as yet hardly solved and it does not seem as if, in the light of our present accomplishments, any single group of workers is to be capable of attaining the millennium alone. If results are to be commensurate with the importance of the task they must be achieved through a coöperative effort by the practitioners of dentistry and of medicine and by the investigators in both branches of science.

Dental caries certainly the most important division of the dental problem, has followed the march of civilization and may logically be considered as largely the result of abnormal nutritional conditions. Where life is primitive and uncomplicated, save for the natural hazards of existence, and is maintained on an adjacent food supply, unattractive, perhaps, to a cultivated palate but nevertheless apparently suited to the environmental conditions which prevail dental caries is rare or nonexistent. Where the problem of food supply has become complicated by the necessity of processing or preserving or transportation and of storage, where these factors and the equally important factor of acquired tastes and appetites have altered the dietary habits of a people an increase in dental decay has been one of the penalties to be suffered.

History is full of these penalties which we have paid for the comforts and conveniences of civilization and the over-organization of the art of living. The very means which we have developed for protection against one hazard or merely one discomfort has brought two others down upon us. Our appetites and our genius for satisfying them have betrayed us. The ease of manufacturing goods which brought on the industrial changes of the eighteenth century

with their mobilization of the working classes into towns and cities, brought with them also a tidal wave of rickets which swept over Europe and later into America and is only now subsiding, still earlier the convenience of city living for great numbers of the population was largely responsible for famine and pestilence, the early argosies of commerce and of exploration, eager to extend still farther the limits of their world carried with them the seeds of scurvy, the Oriental coolie employing the methods of civilization on a primitive diet has fallen a victim to beriberi by the simple device of polishing away the life-protecting properties from his staple article of diet, the Danish farmers during the World War exported for profit the products of their dairies and bartered the eyesight of their children for foreign gold.

To lengthen the list would be to embark upon a tedious recital. For the conveniences of a mechanical civilization we are sacrificing our nervous stability for the comforts of steam heat we are sacrificing our resistance to infection, for ease of transportation, luxury in reclining and smoothness in walking we are sacrificing our body mechanics and our plantar arches and for palatal stimulation, speed in eating and ease in mastication we are sacrificing our teeth and our dental arches!

It is mainly with the manner in which our dietary habits affect our dental structure that we are interested, but we must look at the problem from as broad a point of view as possible remembering that varying conditions of health may leave their records upon the teeth as upon the bones and remembering that in general, nutrition depends upon the teeth almost as much as the teeth depend upon nutrition. No offence need be taken by the dental hygienist—none is offered—when we cast doubts upon the permanent value of his or her efforts in scraping, cleaning, filing, polishing and possibly simonizing the teeth which are brought in for their periodic overhauling. It is usually doing the best that can be done with the material offered. It is however, as McCollum¹ says, essentially trying to put an attractive superstructure upon a faulty foundation, and the same author is responsible for recalling the words of an eminent dentist who recently made the assertion that most of the sound teeth in the world existed before the tooth brush was invented. So much for the slogan that a clean tooth never decays.

The prevalence of dental caries constitutes a

*Read before the American Academy of Dental Science December 6, 1933.

†Garland Joseph—Physician to Children's Medical Service Massachusetts General Hospital. For record and address of author see "This Week's Issue" page 602.

**SOCIETY MEETINGS, CONGRESSES
AND CONFERENCES**

March 9—William Harvey Society will meet in the auditorium of the Beth Israel Hospital, Boston, at 8 P. M.

March 9—Massachusetts Memorial Hospitals See page 561

March 12—New England Ophthalmological Society See page 561

March 13—Harvard Medical Society See page 561

March 16—New England Roentgen Ray Society See page 561

March 16—Cutter Lecture on Preventive Medicine See page 561

March 20—South End Medical Club See page 561

March 23—New England Pediatric Society will meet in Boston For information address Dr Gerald Hoeffel, Secretary 819 Longwood Avenue Boston

April 13, 20 and 27—Salmon Memorial Lectures See page 443 issue of February 22

April 16—Boston University School of Medicine to Conduct a Clinical Meeting at Boston City Hospital

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E. R. Loveland, Executive Secretary, 132-135 South 86th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C Guy Lane, 416 Marlboro Street, Boston, for details.

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnitz General Secretary Dr H. E. Walther, Gloriastrasse 14 Zurich

September 3 6—American Public Health Association, at Pasadena, California Dr J D Dunshie, Chairman, Local Committee on Arrangements

September 4, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York N Y

DISTRICT MEDICAL SOCIETIES**ESSEX SOUTH DISTRICT MEDICAL SOCIETY**

Wednesday, April 4—Essex Sanatorium Middleton Clinic 5 P. M. Dinner 7 P. M. Speakers Dr Elliott P Joslin and Dr Howard F Root, Boston. Subject "Tuberculosis Complicating Diabetes"

Thursday, May 3—Censors Meeting, at Salem Hospital, 3 30 P. M.

Tuesday, May 8—Annual Meeting Salem Country Club, Forrest Street Peabody Dinner at 7 Speaker to be announced. Subject to be announced.

RALPH E. STONE, M.D., Secretary

221 Cabot Street, Beverly Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of March and May at the Weldon Hotel, Greenfield, at 11 A. M.

CHARLES MOLINE, M.D., Secretary

Sunderland Mass

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

March 14—Meeting notice See page 561

Another meeting will take place in May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D., Secretary

76 Church Street, Winchester, Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T. A. STAMAS, M.D., Secretary

226 Central Street, Lowell, Mass

NORFOLK DISTRICT MEDICAL SOCIETY

March 27—Faulkner Hospital 8 30 P. M. Dr Henry H Faxon and Dr Edward A. Edwards Symposium on "Varicose Veins" Discussion by Dr E. E. O'Neil.

April 17—Hotel Kenmore, 8 30 P. M. Special Business Meeting

May—Annual Meeting Time place and program to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary

1695 Beacon Street, Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

April 5—12 noon at Norfolk County Hospital. Speaker Dr Elliott P Joslin Subject Diabetes

May 3—12 noon at Norfolk County Hospital. Annual Meeting Election of Officers

N. R. PILLSBURY, M.D., Secretary

Norfolk County Hospital, South Braintree, Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program, titles and speakers to be announced

The Medical Profession is cordially invited to attend these meetings

JAMES H. MEANS, M.D., Vice-President.

GEORGE P. REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

March 14—Dinner and scientific program at the Memorial Hospital, Worcester Mass

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C. MILLER, M.D., Secretary

27 Elm Street, Worcester Mass

BOOK REVIEW

Post Operative Treatment By GEORGE S. FOSTER, M.D.
Published by The Christopher Publishing House,
Boston 323 Pages Price, \$5 00

This book shows more ignorance of the subject under consideration than any medical book the reviewer has ever had the misfortune to read. It is badly organized, badly written and full of repetitions. Colloquial expressions and trade names of drugs are freely used. The term "Ochsnerization" is used to describe a form of treatment that appears to be diametrically opposed to the ideas shown in Ochsner's original work and to the use of the term in other clinics.

The book has not even the quality of consistency in error. Beginning on page 296 is a chapter entitled "Don'ts." The first paragraph is as follows: "The entire surgical, as well as the entire medical, field is filled with 'don'ts'." Too often cases are overtreated or overdone. Nature plays a most important rôle in bringing back to normal any pathological condition warranting surgical interference, and this assistance must always be considered. Nature is always ready to give." This seems to the reviewer to be excellent doctrine, but all through the book unwarranted, useless treatments are advised at all stages of convalescence. Some of the treatments seem to be to the reviewer positively dangerous, no matter how carefully the technique of the treatment is carried out. For instance, the application of hot wet dressings to the abdomen every four hours following the removal of mildly infected appendices. Other errors are too numerous to mention. There is no index.

It will be unfortunate if the dedication to the graduates of a good medical school is used in any way in an attempt to sell this book to these graduates or to anybody else.

Mummery⁵, in his excellent report to the Medical Research Council in 1922, summarized the early investigations that had been conducted on the pathogenesis of dental caries. The first experiments on the artificial production of caries were performed in 1867 by E. Magitot of Paris, who believed that caries was a purely chemical process. Where the reaction was alkaline no alteration was found in extracted teeth which were kept in a solution for two years, in an acid solution the whole tooth softened and became black. Prior to these experiments, before the introduction of porcelain teeth, ivory dentures had been used, in some subjects these were found to remain unaffected, while in others they were rapidly destroyed.

Milles and Underwood next, in 1882, incubated teeth in a mixture of bread, saliva and meat, with no changes resulting in the teeth. The mixture, however, was not changed and became putrescent and alkaline, no acid being present there was no action on the teeth. Two years later, in 1884, W. D. Miller laid the foundations for a more modern conception of caries by causing natural cavities to occur in extracted teeth by placing them in a mixture of bread and saliva which was frequently changed and not allowed to become alkaline. Acid alone, it was believed as a result of these experiments, will cause decalcification and a uniform softening of the dentin, decalcification, plus the action of bacteria, causes carious cavities. Mechanical agencies were also recognized, imperfect formation of the enamel leading to its early destruction, and ridges and prominences which are easily broken off, exposing the dentin surface.

In 1922, the same year in which Mummery made his report, Grieves⁶ considered the subject from the point of view of calcium, phosphorus and the organic substances existing in cod liver oil, concluding that, as with rickets, the actual amount of calcium and phosphorus in the diet is less important than the ratio existing between the two. He also noted that the acid ash seems to increase the tendency to the lesion. Howe⁷, beginning his bacteriologic studies in 1914, made note also of the similarity in structure and chemistry of teeth and bones and found that animal experimentation does not support the former belief that carbohydrate material adhering to the teeth fermented with the formation of lactic acid, and resulted in the cavities of tooth decay. Guinea pigs fed on a diet to which large amounts of sugars, dextrin and white flour were added showed no dental defect at the end of a year. Moreover, in osteomalacia and rickets the calcium, phosphate and carbon dioxide ratio is not altered, as it would be if the bone-earth were removed by an acid. Many decayed teeth, however, have shown a great increase in magnesium, which also takes place

when scurvy is induced. Howe concluded that calcium was the most important mineral factor, serving to regulate the equilibrium in almost any irregularity of the body mineral elements. The antiscorbutic factor is necessary, however, or the organism will withdraw calcium from the teeth and parts of the bone.

The Mellanbys have attacked the problem from a somewhat different angle. According to May Mellanby⁸, diet influences the formation of teeth in three ways: a. The calcifying vitamin D increases and seems to control the actual calcifying process, b. cereals act in the opposite way and specifically interfere with tooth calcification, c. sufficient calcium and phosphorus must be included in the diet, the minimum requirements depending largely on a and b. Irradiation acts like vitamin D. Actually those cereals containing the most calcium and phosphorus are worst for the teeth, notably oatmeal and wheat germ, although if oatmeal is boiled for an hour and a half in a one per cent hydrochloric acid solution, so that the starch is converted to dextrose, it loses its power of interfering with calcification. The question is raised as to whether this may be due to the destruction of an anticalcifying agent. Most natural food mixtures, Mellanby believes contain enough calcium for the production of perfect teeth providing sufficient vitamin D is included.

She agrees with Howe that vitamin C deficiency leads to decalcification as with the bone changes in scurvy.

Edward Mellanby⁹, as did Howe, remarks on the similarity in chemical composition between teeth and bones, and expresses his belief that dietetic conditions which determine the formation of good and bad teeth are similar to those controlling bone formation. "Substances," according to his conclusions, "tending to produce perfectly calcified, bright, shiny and evenly arranged teeth include milk, egg yolk, cod liver oil, or indeed substances rich in vitamin D, while cereals in the absence of sufficient vitamin D produce defectively calcified, dull and discolored, unevenly arranged teeth." He finds about a ten per cent exception to the general rule that poor dental structure predisposes to caries, and asserts that a well-formed tooth becomes carious because the dietetic conditions have changed since the tooth was originally formed, on the other hand a poorly formed tooth becomes more resistant to caries if dietetic conditions have improved and secondary dentin is formed.

Marshall¹⁰ feels that the chemico-parasitic theory of Miller does not correlate all of the clinical facts, as in failing to explain the comparatively rare condition of "immunity." He believes that diet plays only a part in the problem and that local conditions as controlled by

very definite challenge to the progressive forces of science, its incidence being variously estimated, eighty per cent of the school children of this country by Holt², ninety-six per cent by Cross, quoted by McCollum, who presents the analogy that ninety-six per cent of the children coming here from the southern part of Europe have sound teeth

Primitive peoples, or peoples living in surroundings to which they have become habituated by centuries of residence, on diets relatively unchanged, are usually comparatively free from major dental defects. McCollum gives various examples to illustrate this point. Catlin in the mid-nineteenth century examined the skulls of many Sioux Indians and was struck with the exceptional completeness and soundness of their beautiful sets of teeth, of all ages, which also showed a total absence of malformation. The chief of a party of fourteen Iowa Indians who visited London with him informed him "that one of the most striking peculiarities which all Indian tribes discovered amongst the white people was the derangement and absence of their teeth, and which they believed were destroyed by the number of lies passing over them." Hrdlička in 1908, on the other hand, reported dental caries to be not rare among Indians of the southwestern United States, though much less frequent than among the whites.

The teeth of the Eskimo, as a whole, are found by Hrdlička to be probably the best of any large group of people living today, although other observers have noted that Eskimos living in contact with trading posts begin to show signs of dental caries. Sixty-eight per cent of Igorot children in the Philippine Islands have been found to have perfect teeth, with the imperfections in the remaining thirty-two per cent so slight that they would have escaped notice if casually inspected. The Highlanders of Scotland, living on a simple diet of natural foods, are comparatively free from dental decay while the Lowlanders, subsisting on a more refined diet, have much decay. Howe³ notes that "every dentist is familiar with the fact that many of the Swedish girls who come to this country as domestics have excellent teeth when they arrive, but after eating our refined and cold storage foods their teeth rapidly decay."

Abnormalities of dentition, however, are not peculiar to modern times either in France, England or Egypt, and Ruffer⁴ doubts whether there was ever an epoch in these countries when the human species was not cursed by toothache. Prehistoric remains in England show great abnormalities in the position of the teeth, and excavations at the Giza pyramids brought to light many skeletons of the aristocrats of ancient Egypt showing that tartar formation, dental caries and alveolar abscesses were at least as common as they are in modern Europe, in sharp contrast to the poorer people of that time, who

were relatively immune to dental disease. Another advantage which the Israelites had over the Pharaohs, and a very tangible one, is thus demonstrated.

In the Hawaiian Islands, Sullivan and Chapel⁵ examined prehistoric skulls, many of them dating back before the invasion of the whites in 1778, and found that nearly all belonging to individuals over forty years of age showed gingival caries. This was attributed to the low calcium and phosphorus content of poi, the principal food of the Hawaiians, derived from taro root. Jones, Larsen and Pritchard⁶ and Hess and Abramson⁷ have more recently commented on the susceptibility to dental decay of Hawaiians, Jamaicans and other tropical races in contrast to the Eskimos, finding in this susceptibility an argument against any close relationship between dental caries and rickets, the latter being a rare condition amongst these peoples.

It is well known that Negroes tend to have better formed, better placed and more resistant teeth than white people, a belief that is borne out by a communication to McCollum⁸ from Dr P. S. Schenck, relative to the teeth of white and colored children of Norfolk Virginia. Here a much smaller percentage of Negro than white children were found to have dental defects, a fact attributed to the habit of feeding the Negro children, as soon as they can eat solid foods, large quantities of greens, cabbage, turnip salad and other vegetables. They do not have the sugars and refined foods which the white child eats, and consequently their diet contains a larger percentage of lime, iron and other salts.

Dr J. A. Murphy⁹, on the other hand, reported that in Washington, D. C., 83.4 per cent of the white as opposed to 88.3 per cent of the colored children had carious teeth, the average number of cavities in temporary teeth of white children being 0.6 as compared with 1.0 for the colored children, and 1.3 in the permanent teeth of the white as compared with 2.3 for the colored. The diets are not mentioned in this communication, but the facts suggest that the usual superiority of the Negro's dental structure may be as much an environmental as a racial characteristic.

As has been said before, it is the teeth with which we are mainly interested at the moment, but our interest embraces the fact that the teeth are living parts of a living body, frequently flourishing as it flourishes and suffering as it suffers. They are indices, sometimes the only obvious ones, of the general state of nutrition, but too frequently their ill health or their faulty position accompanies obvious "skeletal defects, defective musculature, anemia, faulty posture, and other evidences of malnutrition, revealing the fact that a large percentage of our children are not properly developed, and in many cases for lack of a properly planned dietary."

have also been made by Boyd, Damm and Nelson¹⁵ Each child studied had extensive caries, demonstrable by softness of the exposed dentin. Their diets were made similar to those given the diabetic children, but no insulin was given. Four patients were kept on this high fat regimen for two months or longer and in all the caries was arrested and the dentin hardened. Similar results were obtained with a group of children with chronic intestinal indigestion, so-called celiac disease. These patients, on account of their condition, were placed on a low fat, high protein and simple sugar diet, but caries was cured or prevented by the addition of mineral-containing foods and the vitamins.

Bunting, Hadley, Jav and Hard¹⁶, in introducing the results of their own investigations, offer a list of the accepted characteristics of the process of dental caries. According to this, the initial stage of caries is decalcification of the hard substance of the tooth by acids which are not generally distributed in the saliva, but are localized and concentrated on certain areas of the tooth surfaces, most frequently in the pits and fissures of the occlusal surfaces and on certain areas of the approximal, buccal and lingual surfaces where there are opportunities for stagnation and the retention of foreign matter.

All initial lesions of caries contain acid-forming bacteria.

The hardness or softness of teeth may affect the rate of progress and extent of caries, but does not alone determine its occurrence.

Malhygiene of the mouth frequently favors the inception of dental caries, but alone does not determine its occurrence.

The process of dental caries is related to and often determined by certain imperfectly understood constitutional states and conditions of bodily health. These are as follows:

- 1 Heredity
- 2 Age, the susceptibility being greatest during the ages from seven to twenty years
- 3 Health, severe onsets of caries following attacks of general disease and occurring during pregnancy and in undernourished or debilitated children, and
- 4 Racial Influences

The acid theory and the importance of bacterial flora are definitely favored by these observers, who believe that the acid attack takes place beneath an enveloping film or plaque which protects the acids of caries from dilution and neutralization by the saliva. Unlike Tucker, they found an acidogenic and aciduric organism, apparently identical with *Bacillus acidophilus*, in practically every lesion of active caries, and usually failed to find it in the mouths of persons entirely free from caries. They were, moreover, able to produce carious lesions by the experimental application of *B. acidophilus* to teeth in the mouth.

The conclusions are that an adequate, well-

balanced diet with a reduction in carbohydrate and an increase in mineral-containing foods and vitamins is inhibitive to dental caries. The same general type of diet they find, is favored by students of caries, whether they believe that control occurs as a result of decrease in aciduric bacteria, increase of salivary alkalis or hardening of the tooth.

The manner in which an unbalanced diet may affect the welfare of fully formed teeth is discussed by Bodecker¹⁷, starting with the premise that this process may take place by two possible methods: first, from the exterior by means of saliva, and secondly, from the interior by means of the blood. He supports the latter view by indicating that the teeth are vital organs with a nutritive supply from the blood in the dental pulp, the principal elements of nutrition being mineral salts and possibly fat. Mumery⁵ had previously demonstrated the organic nature of enamel by showing its permeability to stains.

Bodecker describes in detail the physiology of dental nutrition, the nutritive fluid of the teeth, or dental lymph originating in the blood of the dental pulp and being secreted by the odontoblasts of this organ. From each of the single layer of odontoblasts covering the pulp surface a long tubelike dentinal fibril passes into the dentin and ends in forked branches which presumably transmit the dental lymph to the organic or protein structures of the enamel. The principal structures in the enamel which take up the lymph from the terminal branches of the dentinal tubules are the tufts, the enamel rod sheaths and the enamel lamellae.

The dental lymph acting in this manner has possibly three functions in the teeth of the child and young adult: first, to complete the calcification of newly erupted teeth by furnishing mineral salts and fats; secondly to act, by its mineral content, as a buffer against external, destructive acids, and thirdly, possibly to discourage the growth of aciduric organisms in the mouth.

Bodecker's conclusions are that the exciting cause of dental decay is probably an acid, generated by the bacterial fermentation of particles of carbohydrate food. Cleanliness is therefore essential. A predisposing cause, or causes, also exists in the nature of an abnormal constitution of the dental lymph developed by the malfunctioning of the pulp and by deficiencies of the blood. The teeth consequently possess a protective mechanism, and diet is probably the all-important factor.

Mitchell¹⁸, writing from the point of view of the pediatrician, accepts the thesis that conditions influencing the development of bone will likewise influence the formation of the teeth, finds a rickets-carries parallelism, and urges the balanced diet, not stressing any one factor.

The most imposing mass of evidence so far accumulated, and the most recent, makes up the

saliva and as modified by the oral flora are still important factors in the etiology

He cites five factors in the causation of caries

1 Anatomic causes, the position of the teeth in the arch in relation to occlusion and contact, also the presence of faults of development such as are considered under the term of hypoplasia

2 Bacteriologic, also having to do with local factors, a thread-like organism, as typified by *Cladothrix placoides* and *Leptothrix buccalis*, fastens to a convenient tooth surface and a bacterial plaque commences, which *B. acidophilus* finds a suitable place for growth

3 The condition of the saliva, providing a favorable environment for bacterial activity

4 The glands of internal secretion, about which little is known, particularly in this relationship

5 The diet, especially in relation to calcium metabolism and the vitamins

Tucker¹¹ doubts whether the decalcification and conditions simulating natural caries produced by the experiments of Miller and others are identical with natural caries, believing that if bacteria are the cause of dental caries, more than one type of acidogenic organism is concerned in the process. In his own experiments on children fed on standard diet with and without orange and lemon juice, although *Lactobacillus acidophilus* was found most frequently and most consistently in the mouths of children whose teeth contained three or more cavities, it was not always found even in those cases in which there was shown to be a high susceptibility to caries. The organism also occurred rather frequently and consistently in the mouths of children who had never had any caries, or who had developed no new lesions for two years. *L. acidophilus* is therefore not an obligate producer of dental caries and the experiments indicate that its association with caries is secondary rather than primary.

Howe¹² has arrived at the same conclusions, and believes that the cause of caries will be found in the nutritional field, resulting in some way from the process of calcification, probably as it is influenced by vitamin C.

The value of orange juice in arresting caries, Kugelmass and King¹³ believe, is due not merely to its vitamin C content, but also to its alkali-forming composition. These authors rather logically conclude that the ill effects of high carbohydrate feeding are due to the diminution in the dietary of more important nutrients rather than to the harmful effect of the carbohydrate itself and attach the greatest importance to the base-forming attributes of the diet. They point out that the development of the teeth begins in intra-uterine life with the deposition of lime salts in the deciduous teeth at about the sixteenth week, and that the nutrition of the mother hardly influences the teeth of the fetus, because

embryonic tissue possesses enough growth impulse for nutrition at the expense of the mother unless the maternal malnutrition is extreme.

Jones, Larsen and Pritchard³, in their Hawaiian study, previously mentioned, indicate that in Hawaii odontoclasia occurs in the newly erupted teeth of a high percentage of island born infants, although most of these babies are breast fed and rickets is rare. They point out that the formation of enamel and of dentin in the unerupted teeth do not parallel each other, but that the formation of bone and of dentin do, enamel being an epithelial, ectodermal tissue while bone and dentin are connective, mesodermal tissues. They suggest, that, under certain conditions, those factors which accelerate calcification in the long bones actually increase the liability of enamel to decay, and vice versa. An imbalance may be assumed to exist, they believe, based perhaps on the fact that rickets occurs on an alkaline diet and heals when organic acids are added to the diet, the latter condition being one which is most unfavorable for the formation and preservation of the enamel.

Boyd and Drain¹⁴ have made some of the most notable recent contributions to the study of caries. Although factors leading to enamel defects have been predicated as predisposing a tooth to caries, they point out that other factors must also be involved, as in the middle-aged teeth are found abraded almost to the gingival margins without evidence of active caries. Oral hygiene is admittedly not a preventive, the bacterial factor involved is probably secondary rather than specific.

These authors, in studying a group of children, found many with arrested caries. They were patients who had also salivary calculous deposits which are common in adults but rare in children, and were without exception diabetics who had been under treatment six months or more. In treating these children an attempt had been made to approximate normal metabolism, but fat was used as the chief source of energy. They were otherwise on the essentials of a complete diet with the ash predominantly basic.

According to Boyd and Drain, chemical analysis of carious teeth shows reduction of the calcium and phosphorus, and associated with the development of tooth decay a softening of the adjacent dentin. These changes, by lowering the physiologic integrity of the dentin, permit bacterial invasion to occur. Borderline states of nutritional disease conditions, they believe, must be recognized and studied in relation to the type of diet commonly employed, an analysis of these diets showing them to fall below the optimum values of mineral and vitamin adequacy.

Further observations on non diabetic children

juice alone will not produce a complete cure in every case, the remainder of the diet must be considered as to its mineral and vitamin content and the reaction of its ash. The rôle of bacteria may be secondary to the type of the diet but it must be considered as a possible contributory if not a controlling factor. The excessive use of starches and sugar may not introduce a specific damaging factor but they may contribute to the imbalance either through their acid ash or by replacing more essential food elements. We must furthermore take into consideration certain embarrassing facts which are not easily explainable, the high incidence of caries among various tropical races which partake largely of the citrus fruits, and the immunity of the Eskimos who know not the land where bloom the orange blossoms.

Least understood of all is the influence of the prenatal diet upon the development of dental caries in the young and in any discussion of this particular problem we must avoid the pitfall which might result from a confusion of the causes of rickets and of caries. It is known that in pregnancy, especially in the last two months, at least one gram of calcium per day should be supplied in the diet in order to balance calcium excretion, whereas under ordinary conditions of life 0.45 grams is sufficient. The reason for this is that the average daily calcium retention of the fetus in this period of development is 0.456 grams per day.

Since as we have seen, the fetus appropriates for itself whatever is needed for its bony structure and possibly for its prenatal dental development, it must draw on a preëxisting store of maternal calcium if the day by day calcium in the diet is insufficient for its needs. The best available supply of dietary calcium for the pregnant woman is found in milk, cheese, eggs, fresh fruit and green vegetables, one liter of milk yielding 10 to 11 grams of calcium, but the proper ionization and storage of this calcium should be assured so far as possible. In the darkness of our ignorance rather than in the light of our knowledge, therefore it seems a wise precaution to ensure a reasonable intake of vitamin D, either as cod liver oil, halibut liver oil, irradiated ergosterol or in the form of vitamin D milk, and of the antiscorbutic vitamin which we have found to be usually so necessary in the prevention and cure of dental caries.

The pregnant woman, however, is an uncertain patient on whom to try dietary experiments, and if we are to concede that on her care part of the burden of the fetal dental development is to depend, our alliance against dental disease must be triple rather than dual, the dentist and the pediatrician must enlist also the coöperation of the obstetrician.

Our attack on this problem, then, must be directed so far as is possible from a sensible angle, and must apparently be in the main a dietary one. We must remember also, and this

is not merely in passing that man is not a standardized animal. Try as we may to standardize his diet, our success will be largely based on his individual idiosyncrasies, his personal and racial prejudices, his age and his digestion, his health or his lack of it.

Let us analyse now the various food groups and see how they fit into a rational dietary scheme.

The necessary minerals may be divided into four groups the first, containing sulphur, phosphorus and chlorine forming the acids, the second containing sodium potassium calcium and magnesium forming the bases the third containing iron and iodine occurring in essential organic complexes, and the fourth containing those which are found only in traces.

Milk remains one of the necessary articles of food in childhood, furnishing, in addition to protein in its most available form, a digestible fat and vitamins A and B, and to some extent D. Its ash is alkaline.

The cereal grains, with an acid ash, furnish many of the minerals, especially iron, and add to the supply of antineuritic vitamin B if the germ is retained. Their protein is not of a reliable quantity or quality, consequently their chief value is as a source of energy. The sugars contribute only energy except for molasses which, being a concentrated vegetable juice, adds also calcium and iron.

The vegetables and fruits contain iron, other minerals and certain vitamins, the green leaves A and B, the raw fruits, especially the citrus fruits, vitamin C. The ash is usually alkaline. They vary greatly in energy production.

Eggs contribute iron and phosphorus and vitamins A and B and are growth-promoting. Nuts are valuable as sources of proteins of good quality, cheese furnishes concentrated proteins, the fat, calcium, phosphorus and iron of milk, and is a source of vitamin A. The meats, with an acid ash, are sources of protein, phosphorus and iron and vitamin B, but are deficient in calcium and vitamins A and C, except for liver and kidney which supply vitamin A as well as being rich in vitamin B, iron and copper.

The fats are primarily sources of energy and add to the palatability of the diet while tending to retard digestion. Milk fat is rich in vitamin A²¹.

In a truly balanced, even if not an orthodox diet, all of the elements necessary for building tissue, furnishing energy and preserving health, including dental health, are present, with the possible exception of vitamin D. This must be added in the form of cod liver oil or one of its substitutes, vitamin D milk or direct irradiation. Vitamin C should be included in much greater quantities than has been our usual custom. In the main we may say that the daily diet of a growing child should consist primarily

volume *Diet and Dental Health* by Milton T Hanke¹⁹, giving in detail the results of the studies carried out in the laboratories of the Otho S A Sprague Memorial Institute at the University of Chicago and at Mooseheart, Illinois, the City of Childhood

Hanke, in discussing cause and prevention, discounts the importance of aciduric and acidogenic organisms, and finds that plaques may be present for years upon a completely healthy enamel surface. Places in which decay occurs are regions of stagnation and may be areas that have been subjected to strain. While he admits that decalcification of the tooth structure might be caused by such acids as are produced by bacteria in these regions, it might also conceivably be caused by the enzyme phosphatase, the presence of which in the mouth has been demonstrated. In prevention, the vitamins A, B, C, and D and the phosphates have, respectively, been held to be specific agents, and all of them are probably factors. The best results are doubtlessly obtained when a liberal, diversified diet is ingested, but there are still cases in which dental caries continues even though an excellent diet is being adhered to.

Caries is definitely associated by Hanke with scurvy and the antiscorbutic vitamin. Guinea pigs on varying degrees of vitamin C deficiency and in varying stages of the development of scurvy show proportionately retrogressive changes in pulp and dentin with altered or disappearing odontoblasts and, in a certain stage of the deficiency, with newly formed dentin free from tubules and imperfectly calcified. The conclusion can probably be drawn, he believes, that pre-scurvy, in man, can lead to changes in the pulp and dentin of human teeth similar to those determined for the guinea pig, with similar repair processes.

The main points brought out by Hanke's studies on human subjects are that considerably greater amounts of vitamin C are necessary to preserve health and prevent or cure caries than had previously been appreciated, and that other factors than the vitamin C intake determine susceptibility to the condition. Thus, while the addition of a pint of orange juice and the juice of one lemon to the daily diet has reduced the amount and the severity of the disease markedly in all cases, the incidence of caries is still greatest in those groups that had previously had the most decay.

His studies on the potency of various sources of vitamin C indicate that fresh orange juice is about twice as effective as either canned or fresh tomato juice, slightly more effective than grapefruit juice, and about the equivalent of lemon juice. Orange juice that has stood for twenty-four hours in an open vessel has not lost any of its potency. Raw cabbage is a rich source of vitamin C, but uncertain because of the speed with which the vitamin is destroyed when the juice is exposed to the air. The total daily

amounts of orange juice necessary to prevent or cure caries are considerable, approximately a pint for the treatment of simple caries, running up to a quart for the cure of severe gingivitis, with at least eight ounces for a maintenance ration.

Hanke's conclusions are as follows:

1 The average American diet is adequate in calories but appears to be deficient in certain substances that are requisite to dental health. This dietary deficiency may be the ultimate cause of much of the gingivitis, pyorrhea, and dental caries with which we are afflicted.

2 Gingivitis and dental caries can occur in the majority of a large group of children who are receiving a quart of milk, one and one-half ounces of butter, a pound of vegetables, half a pound of fruit, and nearly one egg a day. These foods do not, therefore, contain substances that are specifically antagonistic to gingivitis or dental caries.

3 The addition of a pint of orange juice and the juice of one lemon to a diet that is nearly adequate in all other respects supplies something that leads to a disappearance of most of the gingivitis and an arrest of about fifty per cent of the dental caries.

4 Dental caries again becomes rampant and gingivitis redevelops in most of the cases when the citrus fruit intake is reduced to three ounces a day for one year. Three ounces is not enough.

5 Children display a definite tendency toward the development of carious lesions which is nil or low in some cases and high in others. The administration of an adequate amount of citrus fruit juice to a diet that is nearly adequate in other respects reduces the intensity of the caries process, but does not completely remove the effect of the inherent tendency in all cases.

6 Orange and lemon juice contain something that acts as a growth stimulus to children.

We see, therefore, that various theories, based upon more or less substantial evidence, have been adduced to explain the pathogenesis of dental caries, enamel defects, anatomic and developmental anomalies, local mouth condition and neglect of dental hygiene, the bacterial plaque and the rôle of aciduric and acidogenic organisms, the acid ash, mineral lacks, carbohydrate insult, and deficiencies in practically all of the vitamins, of which a vitamin C deficiency seems to play a prominent rôle.

The search for an outstanding specific factor, however, appears to have been a misleading one. Rather is it evident that the synergetic action of a constellation of factors is necessary to produce the fault and to correct it. There is no simple philosopher's touchstone which by some divine chemical process can settle the question once and for all. It is too apparent that of the tenable theories the working of one depends in some way upon the working of another. Orange

THE INFLUENCE OF THE METHOD OF DELIVERY
UPON THE PREMATURE INFANT MORTALITY

The records of 291 premature infants delivered in the Boston Lying-In Hospital in 1929 and 1930 have been analyzed to discover the mortality associated with the various types of obstetrical delivery (Table 1)

TABLE 1

A Table Compiled from the Records of 291 Premature Infants Delivered in the Boston Lying In Hospital in 1929 and 1930 Showing the Mortality Associated with the Different Methods of Delivery

Method of Delivery	Total Number of Cases in Group	Number of Living Infants	Number of Dead	Mortality in Per Cent
Low Forceps	27	22	5	18.0
Normal Delivery	163	121	42	25.7
Breech Extraction	31	18	13	42.0
Cesarean Section	63	35	28	44.4
Version and Extraction	7	3	4	57.0

Contrary to existing opinion, the *present technique* of cesarean section appears according to these statistics, to be one of the most hazardous methods that could be elected for the delivery of a premature infant. The mortality for infants delivered by cesarean section was 44.4 per cent while that for normal and low forceps deliveries was 25.7 per cent and eighteen per cent respectively.

In order to contrast the mortality for full-term infants and premature infants when delivered by cesarean section the records of the sixty-nine abdominal deliveries performed in this hospital in 1931 were examined. Fifty-six of the cesarean sections resulted in the delivery of full-term babies with no deaths. Thirteen resulted in the birth of premature infants weighing five pounds (2270 grams) or less, of whom six died (46 per cent). The birth weights of those living were, respectively, two pounds two ounces (968 grams), three pounds eight ounces (1589 grams), four pounds eight ounces (2043 grams), four pounds eight ounces (2043 grams), four pounds eleven ounces (2128 grams) and four pounds fifteen ounces (2241 grams).

This serious indictment of cesarean section as a method for the delivery of premature infants stimulated a further investigation seeking to discover an explanation for the high mortality found associated with the procedure. Answers were sought to certain questions. Did the babies delivered by hysterotomy represent infants of smaller birth weight and thus explain the mortality? Did the serious medical

complication of pregnancy present in the mother, which necessitated the cesarean section delivery, so lower the viability of the fetus as to help explain this high death-rate? Were there any other factors, besides the actual cesarean section, that could be discovered to explain the high premature infant mortality following abdominal delivery?

THE INFLUENCE OF THE SIZE OF THE INFANT AT BIRTH AND THE COMPLICATIONS OF PREGNANCY PRESENT UPON THE MORTALITY ENCOUNTERED IN THE VARIOUS TYPES OF DELIVERY

In an attempt to discover the influence of the size of the infant at birth and the medical complication of pregnancy present in the mother upon the mortality associated with the various types of delivery, the records of 162 premature and immature infants were analyzed. The results of this investigation are submitted in table 2.

Eighty infants were found whose mothers gave no history of any medical complication of pregnancy. In every instance the mother had gone into labor spontaneously. Sixty-two had been delivered normally or by low forceps with a mortality of 11.3 per cent while eighteen had been delivered by breech extraction with a mortality of thirty-three per cent. There were no cesarean section deliveries in this group. Inspection of the birth weights of the living and the dead fails to provide an adequate explanation for the mortality encountered. The probable explanation for the breech mortality was the unavoidable trauma incident to the rapid delivery of the un moulded head resulting in intracranial hemorrhage.

There were forty-three infants delivered from mothers suffering from pre-eclamptic toxemia. Twenty-eight of these were delivered normally or by low forceps with a mortality of seven per cent. Fourteen of this latter group went into labor spontaneously and were delivered with a mortality of 14.3 per cent while the remaining fourteen were induced with no deaths. Twelve infants were delivered by cesarean section with a thirty-three per cent death-rate. Inspection of the birth weights of the infants of toxemic mothers eliminates size at birth as an explanation for the mortality encountered.

The infants delivered of mothers who had bled prior to delivery comprised a group of twenty-four babies of whom seven were delivered normally or by low forceps with a mortality of 28.6 per cent while fifteen were delivered by cesarean section with a forty per cent death-rate. Again inspection of the birth weights failed to offer an adequate explanation for the difference in mortality. The occurrence of bleeding was attended by a high infant mortality irrespective of the type of delivery. The probable explanation is that placental hemorrhage deprives the fetus of

of a quart of milk, an adequate source of vitamin D, eight ounces of orange juice or their equivalent, a pound or more of vegetable with one raw vegetable or fruit in addition to the orange juice, one or more eggs, and meat, if possible, once a day. The basic diet having been supplied, the additional calories may be made up with starches or other foods. It is easier to change the monetary system than it is the dietary habits of a nation, but so far as our present problem is concerned the latter is the more important.

Finally, we should avoid faddism and easy ways to attain an hypothetical goal, scrutinizing with care the elaborate claims of manufacturers of this, that or the other concentrated, desiccated and biologically assayed preparation. Man cannot live by bread alone, but neither can he substitute for the natural fruits of the earth the dynamic contents of a pill of any potency.

Of all the midnight marsh glows that civilized or semicivilized man has followed in his pursuit of the true light that would lead to complete and permanent health, the most have been built about his diet. True, his diet has changed as he and his environment have changed, and certainly not always for the better. The focus has shifted from calories to ash and from ash to vitamins, and has rested on those mysterious substances to be found in liver and the gastric glands, until it has seemed almost as if the lowly tripe were at last to come into its own.

From the wheat lands has come a paean of glory in favor of crumbled toasties, and from the plantations of the citrus growers a trumpet note has sounded the knell of acidosis. Still, it must be believed, we are coming nearer to a true understanding of the metabolism of digestion,

of man's wants and of the deficiencies which he has imposed upon himself. We are realizing at last that those foods which are nearest at hand, which are most edible in their natural state and which require the least preparation and processing are the best suited to our needs.

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A CONSIDERATION OF THE OBSTETRICAL MANAGEMENT OF PREMATURE LABOR*

BY STEWART H. CLIFFORD, M.D.†

AT the Boston Lyng-In Hospital about three per cent of the 3000 deliveries per year result in the birth of premature infants—yet this three per cent accounts for fifty per cent of the total neonatal deaths. This latter figure would be much higher were it not for the fact that in the last seven years the gross premature infant mortality has been reduced from fifty-five per cent to between thirty-three per cent and thirty-eight per cent for the past

three years. The inability of our present methods to lower further the number of premature infant deaths suggests that new means of attacking the problem must be found.

During the past seven years 243 premature infants have died in the hospital and of these 205, or eighty-five per cent, have died within the first forty-eight hours following birth. This latter fact suggests that the effective approach to the problem will probably be along obstetric rather than pediatric lines. To this end the records of 304 premature infants have been studied as to the influence of the various obstetrical procedures and of the maternal medical complications of pregnancy upon the fate of the infant.

*This is the third in a series of studies on the Reduction of the New Born Infant Death Rate from the Boston Lyng-In Hospital. The Departments of Obstetrics and Pediatrics of the Harvard Medical School and the Department of Child Hygiene of the Harvard School of Public Health.

†Part of a communication originally read before the Boston Obstetrical Society on October 18 1932.

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oxygen and produces grave intra-uterine asphyxia. The present investigation did not include the infants dying in utero so that the mortality figures refer to infants who had suffered a milder but nevertheless eventually fatal degree of asphyxia. The influence of drugs administered to the mother during labor may have played an important part in the production of extra-uterine asphyxia and may help to explain the mortality encountered. This factor will be discussed in more detail in another section.

There were fifteen infants born of mothers with heart disease, and of these six were delivered normally or by low forceps without a death. Nine were delivered by cesarean section with a mortality of sixty-seven per cent. Three of the six deaths after hysterotomy were in infants weighing more than four and one-half pounds whose mothers had received an injection of morphine within an hour of their delivery.

THE INFLUENCE OF ANTEPARTUM ADMINISTRATION OF MORPHINE UPON THE PREMATURE INFANT MORTALITY

The antepartum use of morphine is discouraged in this hospital except under special circumstances. The records show that it is sometimes administered in the presence of vigorous bleeding, in heart disease and in an effort to arrest premature labor. It is important to note that the indications for the use of morphine or its derivatives frequently result in its having been administered prior to the delivery of a premature infant.

In every instance, in this short series where the mother had received an injection of morphine within one and one-half hours of the birth of a premature infant, that infant has been dead within forty-eight hours. At birth these infants have been cyanotic, limp and very difficult to resuscitate. In other words their respiration has been embarrassed and they have presented the clinical picture of asphyxia or respiratory center failure. In table 2 an asterisk identifies the seven morphinized infants in whom this condition was present. The antepartum use of morphine is held to be responsible for three of the six deaths following cesarean section delivery of mothers with heart disease, and for two of the six deaths following the same method of delivering the mothers with vaginal bleeding. Four of the infants dying with a history of morphine antenatally weighed over four pounds eleven ounces (2128 grams). One of these infants, weighing five pounds twelve ounces (2605 grams), lived sixteen hours with continuous cyanosis and profound respiratory distress, and at autopsy showed microscopically actual degenerative changes in the medulla as the sole explanation for the extra-uterine asphyxia.

DISCUSSION

Any successful method of handling the premature infant, whether it be by the obstetrician at delivery or by the pediatrician after birth, must be founded upon an appreciation of the peculiar physiological characteristics of the premature child. The two most striking physiological characteristics of obstetrical importance are the following: the ease with which serious bleeding may take place, and the marked inefficiency of the immature respiratory center. Hemorrhage is the chief cause of premature infant death in the early days of life and evidence of some degree of bleeding will be found in the majority of autopsies performed on these infants. This bleeding may consist of petechial hemorrhages scattered throughout the organs or of gross hemorrhage chiefly in the intracranial region. It is generally appreciated that this bleeding may occur with the slightest trauma, but of equal importance is the hemorrhage that may occur secondary to intra- or extra-uterine asphyxia. The mechanics by which this latter type of hemorrhage occurs is not clear, it may be due to an increase in blood pressure coupled with actual weakening of the blood vessel walls secondary to the anoxemia. Whatever the true explanation may prove to be, the successful delivery of a premature infant must protect him not only from every possible trauma, but also from asphyxia.

The inefficiency of the respiratory center in the premature infant is well known. Cheyne-Stokes type of respiration is so commonly seen in these babies as to be considered almost a normal finding. The ease with which cyanotic attacks occur in premature infants is still further evidence of the depressed condition of the respiratory center. With the vital centers of the medulla in this extremely susceptible state, any superimposed depressant factor is likely to be incompatible with life. Edema or hemorrhage in the medulla resulting from trauma or asphyxia are the most commonly considered factors causing a fatal depression of the respiratory center, but the present investigation suggests that certain drugs administered to the mother during labor may exert an equally dangerous depressant action upon this vital area.

Delivery of a Premature Infant by Cesarean Section

One must face the fact, whatever the explanation will prove to be, that the premature infants in this series, when delivered by the present technique of cesarean section, actually encountered a much higher mortality rate than those delivered normally or by low forceps. This higher mortality does not find a satisfactory explanation in the lower weights of those delivered by hysterotomy. It does not seem to

hemorrhage the fetus is exposed to an even greater danger of intra-uterine death than is the case in toxemia. Since it is now possible to know the size of the fetus *in utero*¹, the question arises as to whether it would be safer to terminate pregnancy in these cases when a viable infant can be demonstrated, or to allow pregnancy to continue and expose both the fetus and the mother to the possible danger of a massive hemorrhage.

The Management of Premature Labor in Heart Disease

When pregnancy is complicated by heart disease, normal or low forceps delivery is attended by a very low mortality rate while delivery by cesarean section encounters a sixty-seven per cent rate. Here again the antepartum use of morphine is the probable cause of the high mortality in the hysterotomy cases.

Apparently when heart disease is the only complication of pregnancy the fetus is not exposed to the danger of intra-uterine death and pregnancy may be allowed to continue to as near full term as the condition of the mother will permit. Increased experience may demonstrate the advisability of inducing labor in patients with heart disease when a viable baby can be assured¹, thus sparing the mother the strain of an unnecessary prolongation of pregnancy.

CONCLUSIONS

1 A statistical study of the records of 304 premature infants has revealed that the safest method of delivery is either normally or by low forceps while the most dangerous is by the *present technique* of cesarean section which carries a mortality of 44.4 per cent.

2 The antepartum administration of morphine within one and one-half hours of the delivery of a premature infant was found to be associated in every instance with the death of that infant*.

3 The peculiar physiological characteristics of the premature infant have been discussed as to their bearing upon the successful obstetrical management of premature deliveries.

4 This high mortality was not felt to be due

To date the possible influence of morphine has been investigated further in 550 consecutive premature infant deliveries. Seven hundred and fifty-two mothers received no morphine within 4 hours of delivery—Infant Mortality 36%. Ninety-eight mothers received morphine within 4 hours of delivery—Infant Mortality 60%.

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to a smaller size of baby delivered by hysterotomy or to the presence of toxemia in the mother. The high mortality associated with delivery by cesarean section is not felt to be due to the actual operative delivery itself, but rather to the depressant effect of morphine and possibly either upon the physiologically immature respiratory center of the premature infant.

5 Cesarean section is the logical method for the safe delivery of a premature infant. It undoubtedly eliminates the factor of trauma during delivery, but the present technique substitutes an even more dangerous one, asphyxia, in its place. Improvements in the method of cesarean section that will protect the premature fetus from intra- and extra-uterine asphyxia as well as trauma should establish abdominal delivery as the safest possible method for the delivery of a premature infant.

6 In pregnancies complicated by toxemia and placenta previa there is a risk of fetal death and possible danger to the mother in allowing pregnancy to continue to its natural termination. The question is raised as to the wisdom of artificially terminating these pregnancies at the point when a viable fetus can be demonstrated by stereoroentgenometric examination.

7 In pregnancies complicated by heart disease there is apparently no danger of intra-uterine fetal death should pregnancy be prolonged to full term. There is a risk to the cardiac mother in an unnecessary prolongation of pregnancy. The question is raised in this connection as to the wisdom of artificially terminating pregnancy in these cases when viability of the fetus can be demonstrated.

8 The present conclusions in regard to the obstetrical management of premature labors are presented at this time in the hope that they may stimulate discussion and further investigation. They are purely tentative and will undoubtedly be considerably revised as our experience grows. Obstetrical attention can be profitably concentrated on bettering the conditions in a group of infants that, while representing but three per cent of the total number of deliveries, accounts for fifty per cent of the neonatal deaths.

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find an explanation in the assumption that the serious toxemia present in some of the women resulted in babies with less chance of living, for the figures show that these babies actually have a lower mortality rate than those from mothers with bleeding or heart disease also delivered by cesarean section. Furthermore, these patients with severe toxemia, exhibit a low mortality rate when delivered from below.

Rationally, cesarean section should be the ideal method for the safe delivery of a premature infant, and that it is made to appear in such an unfavorable light demands an explanation. The clue to the problem would seem to lie in the peculiar physiological characteristics of the premature infant himself. The premature infant cannot be treated as just a small edition of a full-term baby, and methods that may be successful with the latter are not necessarily the most advisable when dealing with the immature organism. The full-term infant may be none the worse through absorption of antepartum morphine administered to the mother—beyond requiring resuscitation at birth. Morphine prior to the birth of a premature infant, on the other hand, either lowers the threshold of an already depressed respiratory center to a point where there is no attempt at respiration, although the heart is acting normally, or respiration may be instituted but at such an inefficient level that anoxemia is constantly present. In the latter situation death soon takes place, usually as a result of hemorrhage or pneumonia that would appear in this case to be secondary to the asphyxia.

We are at present pursuing this line of investigation further with the suspicion that ether may exert a similar, but less fatal, depressant action upon the immature respiratory center and thus be partly responsible for the high mortality associated with delivery by cesarean section. Abdominal delivery under ether anesthesia may be the safest possible method for the delivery of a full-term infant, but it remains for future investigations so to modify the technique that it may be made safe for the premature child.

The Management of Premature Labor in Normal Pregnancies

In the presence of a threatened premature labor, with the infant presenting by the vertex, the safest procedure appears to be to allow normal delivery from below assisted by an episiotomy and possibly application of low forceps. It would be extremely dangerous to attempt to arrest labor through the administration of morphine.

The delivery of a premature infant by breech extraction is attended with a high mortality due to intracranial hemorrhage. At the present time this mortality is no higher than that asso-

ciated with cesarean section, but if the cesarean section hazard can be lowered, as we believe it can be, it may eventually be safer, from the point of view of the infant, to deliver these babies by the abdominal route.

The Management of Premature Labor in Toxemia

The lowest premature infant mortality rate, in pregnancies complicated by pre-eclamptic toxemia, appears to be in the group in which labor is artificially induced and the baby delivered from below. The patients going into labor spontaneously and delivering from below have the next lowest mortality. A possible explanation for the lower death rate in the former group is discussed at the end of this section.

In the toxemia cases, delivery by cesarean section is responsible for the greatest percentage of fatal cases. Future studies may produce a safer method of hysterotomy, but as it now stands cesarean section is a hazardous operation from the point of view of the baby.

The fetus *in utero* of a patient suffering from toxemia is exposed to an additional hazard of intra-uterine extinction that exerts a strong influence upon the obstetrical management. The placenta in toxemia may become diseased to the point where fetal life is impossible, or as a result of this disease it may separate prematurely and cause fetal death by intra-uterine asphyxia before delivery can be accomplished. Since it is now possible to determine the minimum weight of the fetus by stereoradiography¹, it may prove safer to terminate pregnancy in toxemia at a point where a living viable fetus can be demonstrated rather than allow pregnancy to continue to its natural termination with its risk of intra-uterine death.

The Management of Premature Labor in Bleeding

Irrespective of the method of delivery, the premature infant faces his greatest risk in the presence of vaginal bleeding. The reason for this would seem to be that bleeding indicates a separated placenta or a placenta previa, and in either case indicates a serious interference with the normal placental exchange. A second reason for the high mortality associated with bleeding is the fact that the treatment of the hemorrhage may include the maternal administration of some form of morphine.

According to the available statistics, delivery from below in the presence of bleeding is attended with a slightly lower infant mortality than delivery by cesarean section. The figures are open to the criticism that the normal delivery takes place in patients with minor or arrested hemorrhage, while cesarean section is frequently an emergency measure to cope with a massive hemorrhage.

In the presence of bleeding or threatened

the Greeks made notable advances in contraceptive medicine. To be sure, two Egyptian papyri, the Petri or Kahun papyrus and the Ebers papyrus, dating respectively from 1850 B C and 1550 B C, show conclusively that many centuries before the Christian Era the Egyptians recommended vaginal suppositories of gummy and sticky substances (gum arabic, honey, crocodile dung, natron [native sodium carbonate] etc). The dung pessary has been traced through the literature for approximately three thousand years. The tips of acacia, mentioned in the Ebers papyrus, break down under fermentation into lactic acid, a substance widely used in recent years in jelly form as an ointment for rubber vaginal diaphragms and caps.

Among the Greek and Roman writers who discussed contraception are Aristotle (IV-2 B C)*, the pseudo-Hippocratic writers (IV & V B C), Lucretius (I-1 B C), Pliny (I-2), Dioscorides (I-2), Soranos of Ephesus (II-1), Oribasios (IV-2) and St Jerome (IV-2) and Aëtios of Amida (VI-1). Of these the most important authors are Soranos, the greatest gynecologist of antiquity, who produced incidentally, in his *Gynecology* the most brilliant account on contraception until Knowlton (1832)¹. The next most important figure Aëtios of Amida (VI-1), was less original and brilliant. He did well by knowing whom to select as his master, Soranos. Pliny is full of superstition on this as on other subjects, while Oribasios mentions the subject only briefly. Aristotle's mention in the *Historia Animalium* in the fourth century B C (the first mention among the Greeks) of anointing the os "with ointment of lead or with frankincense, commingled with olive oil," is historically important.

To return to Soranos. I have recently published in the *New England Journal of Medicine* the first English text of Soranos's discussion of contraception². He details for us an elaborate array of occlusive pessaries (more exactly, suppositories) of various types, vaginal plugs using wool as a base, and impregnated with gummy substances such as sour oil, honey, cedar-gum, opobalsam and galbanum. The astringent solutions mentioned, alum and natron, contract the os and make impregnation less likely. Gummy and oily substances, of course, reduce the motility of spermatozoa. The use of native fruit acids is not without interest in view of recent researches by Voge and Baker^{14, 15}. Pomegranate pulp or rind is acid, gall-nut contains gallic acid. Fig pulp is also mentioned. Acids and alkalines, if not neutralized by buffers, and if strong enough to upset the normal vaginal condition, provide a hostile environment for sperms.

Soranos thought the "damage" done by position-drinking "very considerable"—a modern

view, and he scoffed at the use of amulets, even more commonly used in the Middle Ages than in antiquity to prevent conception.

Turning to the early Christians and Hebrews everyone is familiar with the reference to Onan, who, by the way, was, on a proper interpretation of the text, slain not for practising *coitus interruptus*, but because he failed to fulfill the law of the levirate and raise progeny by the wife of his deceased brother.

The Talmud mentions embryotomy, *coitus interruptus*, spongy substances (makh) placed before the os, violent bodily movements designed to expel the semen—this dates from preliterate society as does *coitus interruptus*—and potions. There is also some discussion of indications, rare in the early period, though Soranos had by no means neglected them. Though the early Hebrews disdained sterility, as every primitive group did, the obligation to be fruitful and multiply was, curiously enough, not incumbent on the woman but only on the man. Dr Solomon Gandz, perhaps America's greatest Talmudic scholar, who prepared the chapter on the Talmud for my treatise, so informs me. He says that since the woman, who was free from the duty of propagation, employed the contraceptives, there was no reason in Hebrew law and morals to forbid their use, especially when medically indicated. All this may seem curious to us, but such is the verdict of an expert. Moreover, granting the assumptions, the conclusion is logical enough.

Compared with what is to be found in Greek, Roman and Islamic sources, we find little mention of contraception in ancient Sanskrit and Chinese sources. This should not, however, convey the impression that the record is blank. The early East Indian writers mentioned chiefly an elaborate array of potions, the ancient Chinese had potions also, though fewer in number, despite the prevalence of ancestor worship and the dominance of the doctrine of filial piety. *Coitus obstructus*, which is more or less widespread, also appears in Sanskrit sources antedating the fourteenth century (The *Ratirahasya* by Kokoka). Pressure of the finger at the base of the phallus just before ejaculation causes the semen to regurgitate into the bladder. The magical Sanskrit prescriptions ranged from rubbing the navel or the soles of the foot with salves made of native flora to drinking potions. Of rational remedies there are few indeed. Of 27 Sanskrit recipes that I have collected, 23 are magical (19 are potions) and only four rational or quasi-rational. Among the latter are *coitus obstructus*, smearing the vagina with honey and ghee (an oily residue made by boiling down butter), vaginal medication with rock salt dipped in oil, tampons of ground *ajowan* seed and rock salt with oil. It may be remarked that ordinary table salt is an excellent spermicide. An eight per cent solution kills sperms rapidly. As used in

* IV 2 means second half of the fourth century. The same system is employed throughout for brevity.

MEDICAL HISTORY OF CONTRACEPTION*

BY NORMAN E. HIMES, PH.D. †

Members of the Boston Medical History Club

I COME before you with some timidity as a layman. Let me assure you at once that my investigation of the history of contraception has proceeded from no desire to usurp a medical function. A prominent medical body, the National Committee on Maternal Health of New York, requested me in 1930 to undertake it probably because its officers realized that a few years previously I had, as a fellow of the Social Science Research Council, made a special study of the social and economic aspects of the birth-control movement especially in England, together with the first independent quantitative study of the clinical records of English contraceptive clinics. A cursory survey soon showed that medical historians had paid virtually no attention to the subject. I had not investigated the history prior to 1800, and was anxious to find out something about it. Accordingly, letters were sent to some thirty prominent medical historians requesting references to the medical literature produced before 1800. Only two or three helpful replies were received. The lack of interest, therefore, on the part of medical historians was the first inducement. The second was the realization that such an historical account might interest not only the physician but the historian, sociologist, economist and anthropologist. If the subject went beyond my depth medically, there was always the medical board of the Committee to assist. Moreover, had not Hippocrates himself said that the good physician will not hesitate to learn from the special investigations of laymen?

What was originally intended to be two chapters for a medical source book, soon developed, as I delved into the original sources, into a monograph of 900 pages with a bibliography of approximately 2000 titles. This is about to go to press as *The Development of Birth Control. A Chapter in Medical History*. What follows are leading facts or generalizations excerpted from that volume, and, if at times my statements seem dogmatic, I can only plead lack of time to support them, and make the urgent request that you cross-examine me in the discussion to follow.

The first important fact to get straight is that birth control as a social practice did not begin in response to the teachings of Margaret Sanger or Marie Stopes, not even with the prosecution in London in 1877-1879 of Bradlaugh and Besant for re-issuing the Knowlton pamphlet, nor even with Francis Place's propaganda in the 1820's. As a social practice contraception goes back to the period of prehistory, to the primordial tribes

of which contemporary primitive races may be said to be the social fossils. As a social movement, as I shall show later, birth control dates from the agitation led by Place in 1823.

Another important conclusion is this. My study shows, I think conclusively, that the desire to control conception, as distinct from its scientific achievement, not only antedates its written history, but is a cultural factor, a personal behavior pattern found in nearly all prominent civilizations in some degree at all times.

A survey of primitive societies by tribes and continents shows that several had crude contraceptive knowledge, but that more commonly the volitional checks were abortion and infanticide. Most primitive societies had a controlled population. As to rational preventive methods, *coitus interruptus* was perhaps most common. The most unique, perhaps, is a sort of female condom used by the Djukas of Dutch Guiana. It is made of a native seed pod resembling our milkweed pod. One end is snipped off, the other inserted in the posterior fornix of the vagina, and the open end receives the penis and semen. The highly-spermicidal lemon juice is reported in use by one tribe, but there is some doubt about the credibility of the report.

There is much difference of opinion among anthropologists regarding the purpose and sterilizing effectiveness of an Australian operation on primitive males known as subincision (*mica*, *koolpi*). This consists in dissecting out portions of the urethra or even all the conduit. The controversial literature cannot be reviewed here. German writers have, generally speaking, considered it effective. American and English anthropologists consider it a status-giving rite, the boy is not a member of the tribe until the mutilating ceremony is performed. Some anthropologists have even gone so far as to say that it does not affect fertility. This position seems to me extreme. Clearly such an operation would reduce the optimum conditions for impregnation.

In the Malay Archipelago ovariectomy and artificial retroflexion of the uterus by massage is reported, but, since the organ tends to assume its former position, such manipulations by midwives must be useless.

Taboos on sex intercourse are frequent in primitive societies, and many are the groups the medicine men of which have devised concoctions to be taken by the mouth. But no potion so taken is known to be effectively contraceptive. Weird magical procedures are so numerous among preliterate peoples as to baffle an attempt to detail them in a short account. The knot-tying variety have persisted through folk medicine into late modern times.

Turning now to the civilizations of antiquity,

*Address before the Boston Medical History Club, December 17, 1933.

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Examples are the use of a sponge by the rural women of Southeast Poland and in the Ukraine, and the use of beeswax intravaginally by German-Hungarian women in Banate Slovak women and women of the Styrian Oberland, who stuff the vagina with cloth or with linen rags, are reminiscent of the African natives reported by W E Masters³. These African women did likewise. Constantinople women are reported to have soaked a sponge in diluted lemon juice, and to have used it as a vaginal tampon.

The persistence of such folk practices for thousands of years is convincing proof of the thesis that women have in all cultures and in all ages desired to control fertility. To be sure, they have disdained sterility, but they have also wanted controlled fertility, that is, a reasonable number of children at convenient times and under the conditions desired. What is new is not the desire for prevention, but effective, harmless means of achieving it on a grand scale.

The history of the condom or sheath is intimately bound up with the history, since the fifteenth century, of man's attempt to protect himself from the scourge of syphilis. It seems reasonable to conclude that this was its first use medically⁴, certainly its first use on a large scale. One may doubt the legend of Minos and Pasiphae that the sheath was used in Imperial Rome. The first written mention that has come to my attention is that in Fallopius's *De morbo gallico* (1564). This was a linen glans condom. Only later were the caeces of various animals used. Gradually what was used for protection against syphilis came to be used to prevent conception and by the late eighteenth century they were publicly advertised in England. The real revolution was a result of the vulcanization of rubber by Goodvear about 1840. The much cheaper rubber condom then found a wide market. One associates the vulcanization of rubber with a revolution in transport, less frequently with a revolution in morals and in the birth rate. The extreme popularity of the instrument is not sufficiently realized. The fifteen chief manufacturers in the United States produce a million and a half a day⁴, and it has come to light in a recent court case that one American manufacturer sold 20,000,000 during one recent year⁵. Harmsen reports that one German firm puts 24,000,000 rubber condoms on the market every year⁶.

After 1800, developments in the medical history of contraception are so numerous as to render succinct, balanced summary difficult. There is time to dwell only on a few points briefly.

After the publication of Malthus's *Essay on*

⁴Coverings for the penis for non-contraceptive uses have a long history that reaches into prehistory. They were used as badges of rank and status as amulets to promote fertility, as coverings to protect against insect bites. The earliest known medical use is their employment by certain tropical natives to prevent bilharzia and condylar tropical diseases caused by minute fish swimming up the urethra. Other primitive groups have used them for decoration or for the sake of modesty.

Population (1798) the medical history of contraception became intertwined with the social and economic phases of that history. Ever since they have been inseparable, if one takes a broad view of the subject. The social agitation dates from Francis Place's (1771-1854) dissemination of popular medical handbills in 1823, and from the publication of Richard Garhile's *Every Woman's Book* (1826). Place's efforts were the first organized, planned attempt in history to educate the masses in contraceptive technique.

The reasons that the birth-control movement as a social movement began at this time rather than before or later are plain but complicated. In short, the chief factors were these. The Industrial Revolution by increasing production, and the growth of public health medicine by dropping the death rate caused population to increase rapidly. There were fears of over-population—not altogether ill-founded at the time. A small group of radicals led by Francis Place felt that Malthus's proposal of delayed marriage would encourage prostitution if followed, but more likely it would not be followed and population control would not be achieved. Hence in his important book on population, published in 1822, he defended early marriage and artificial checks. He advocated contraception likewise in newspaper and periodical articles and gave medical information in his handbills. What Place's daring started is a long story and will require a couple of volumes to tell.

Other social circumstances besides rapid population growth the Industrial Revolution and Malthus's *Essay* were certain tendencies in thought: hedonism, materialism, the gradual breakdown of religious taboos, the growth of the scientific spirit. Recent events have strengthened these tendencies and new ones have appeared: urbanism, the desire to protect a high standard of living, increased social mobility, and improved methods of communicating knowledge.

The demand for birth-control knowledge first became articulate in the United States in 1831 with the publication of Robert Dale Owen's *Moral Physiology*^a. There was nothing original in it medically, its significance being in its pioneering nature, in the social reasoning it contained in the discussion it provoked and in its influence on Charles Knowlton (1800-1850).

Knowlton, a member of the Massachusetts Medical Society, published in 1832 the *Fruits of Philosophy, or the private companion of young married people*. He is the founder of American contraceptive medicine, the first physician to publish an independent treatise on the subject. His is the fullest account since Soranos in the second century—a span of sixteen hundred years. Knowlton saw his problem whole, and discussed not only the medical but the economic and social bearings of his subject. He is the first physician in all time (so far as

our time five tablespoonfuls are dissolved in a quart of water

The chief difficulty with the ancient contraceptive prescriptions is not that some of them are not effective, but that little distinction was made between the effective and ineffective, between the genuine spermicides and the motility-impeding and movement-obstructing remedies on the one hand, and the magical, ritualistic prescriptions on the other. Most physicians were, therefore, unable to make some very necessary distinctions. Besides, such instruction was, in some countries and periods, chiefly in the hands of midwives.

The Japanese contraceptives are of unknown age. There are the *kabutogata* or hard condom made of tortoise shell, horn, or leather, the use by prostitutes of *musugami* (a ball of bamboo tissue-paper before the os), potions and some magical procedures. In the seventeenth century Yokiken Kaibara anticipated two Americans, J. H. Noyes and A. B. Stockham, in advocating suppression of ejaculation. The motive was, however, to prolong life, not contraception. The rubber condom was not introduced into Japan until about 1880.

It was the great Islamic physicians, the Arabians and Persians, who, during the Middle Ages, inherited the medical knowledge of the Greeks and preserved and amplified it for us. The chief contributors to contraceptive medicine in this group were the Persian Ali ibn Abbas (X) in his *Royal Book*, the Arabian Ibn Sina in the great *Canon* (XI-2), the Persian Isma'il al-Jurjani (XII-1) in the *Treasure of the King of Kwarizm* and Ibn al-Jami, *The Book of Right Conduct*. Ibn al-Baitar's *Treatise on Simples* (XIII-2) and Dawud al-Antaki's *Memorial* represent a definite decline in Islamic contraceptive medicine.

There are 31 different recipes mentioned by the first four writers, who represent Islamic contraceptive medicine at its best. The rational element bulks large. There are two potions and one magical method (rennet of rabbit or weeping willow leaves worn as an amulet) and 13 different suppositories and tampons. Among the latter are (a) pulp of pomegranate with alum, (b) rock salt, (c) cabbage leaves with tar. There are nine techniques to be used by the man besides withdrawal, anointing the male organ with such substances as rock salt, tar, onion juice, oils of balsam, sesame, etc. Among miscellaneous techniques are the safe period (dates at least from Soranos), avoiding simultaneous orgasms, sneezing, raising the thigh, bodily movements to void the semen.

This collection is remarkable for the period, and shows clearly the influence of the Greeks, notably Soranos and Aetios. In some instances the mistake was made of recommending the insertion of suppositories after, rather than before coitus.

Islamic physicians, like those of Greece, devoted comparatively little attention to indications for contraception. Ibn al-Jami (XIII) makes no mention of them, but Ali ibn Abbas (X) mentioned "a small uterus" and any "disease which would render gravidity so dangerous that the patient might die during parturition." Ibn Sina (XI) thought contraception indicated for "a small woman to whom childbirth would be dangerous, or [for] women who are suffering from a disease of the uterus or from a weakness of the bladder", while Isma'il al-Jurjani (XII) mentioned a woman of "tender years" and also anyone suffering from "weakness of the bladder", and any case in which "there is fear that pregnancy will bring on some illness such as incontinence of urine, uterine erosion, etc." Thus we see that the germ of the preventive point of view appears early in this field. This is not to gainsay that only recently has it made substantial progress.

The evidence suggests that some Islamic physicians of the Middle Ages were in advance of some of their modern colleagues in this respect. The attitude of Islamic religion, be it noted, was very different from that of early Christianity. Since the doctrine was current that the fetus was not a human being until it had reached the distinctly human form, Islamic religion did not condemn abortion, much less anti-conceptual measures.

Ibn al-Baitar and Dawud al-Antaki represent the same point of view and the same medical tradition with a much greater admixture of magic. Of the writers who stressed magical procedures Dawud al-Antaki is the worst in medical history.

During the Middle Ages, both inside and outside the Islamic world, but especially outside of Islam, there was considerable confidence in the contraceptive powers of drugs, gems and stones. Islam was the preserver of the great tradition. Elsewhere people tended to hold contraceptive views similar to those of Albert the Great, namely, that if a woman spit thrice in the mouth of a frog she would not become pregnant. The Catholic Church then, as now, condemned contraception.

The major portion of erotic literature, I am assured, is silent on contraception. Exceptions are Nefzaoui's *The Perfumed Garden*, Brantôme's *The Life of Gallant Ladies*, and Casanova's *Mémoires*. The first mentioned alum, while Casanova relies on the sheath and the gold ball, used intravaginally.

So far as folk beliefs are concerned it is sufficient to say that many of the superstitions still current, especially among European peasants, are, in some instances, several thousand years old. Such are amulets, knot-tying, coughing, sneezing, the safe period and countless others. Potions and symbolic magic bulk large, but there are a few remarkable recipes on record.

Examples are the use of a sponge by the rural women of Southeast Poland and in the Ukraine, and the use of beeswax intravaginally by German-Hungarian women in Banate Slovak women and women of the Styrian Oberland, who stuff the vagina with cloth or with linen rags, are reminiscent of the African natives reported by W. E. Masters.³ These African women did likewise. Constantinople women are reported to have soaked a sponge in diluted lemon juice, and to have used it as a vaginal tampon.

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I can trace) to have done this, and his place in the history of thought has never been properly appreciated. The *Fruits of Philosophy* was a departure in stressing chemical methods and douching. Their popularity is largely due to his initial deviation, for his little book had great influence abroad, especially in England where it was frequently reprinted. A legal battle in 1877-1879 in London over the right to publish it did much to establish freedom of the press in this line in England.

There are probably fifty nineteenth century writers on contraception in the United States and England alone, most but not all of them physicians, who hold a modest place in detailed history of the movement. But they can find no place in an outline of this character. In the last half century probably fifty German pamphlets on technique have been published for general distribution. From the standpoint of scientific advance they are of no importance. Their significance lies in their effect upon sexual relations and on the declining birth rate, phenomena with both medical and social implications.

Probably the most important technical developments of the nineteenth century were the rubber condom and the Mensinga vaginal diaphragm. I have already mentioned the former. The Mensinga pessary was invented by the German anatomist of that name and is now the chief device used in hundreds of clinics here and abroad. The inventor of the rubber cervical cap is unknown. This cap or "check pessary" appeared in English advertisements about 1870 or 1880 and in the U S A at about the same time. It is still rather widely used.

Suppositories, as we know from the Greek and Islamic accounts, are very old so far as the principle of a physical impediment is concerned. Occasionally the ancients, probably by trial and error, that great educator of mankind, hit upon suppositories employing a rational chemical principle. But generally speaking, suppositories that really melt at body temperature are an invention of the last fifty years. Recent investigations show, however, that some of the supposed active agents contained therein have been relatively ineffective as spermicides. Since they often worked on physical rather than spermicidal principles, we have not been so far ahead of the ancients as is commonly supposed.

Little need be said of the intrauterine devices since they were never widely used, being expensive. Better knowledge of the dangers associated with their use has also limited their market.

The chemistry of contraception is a development of the last few decades. What preceded was guesswork, intuition, trial and error. Clinics now use statistical methods in case series to test various combinations.

We now have from 200 to 500 chemical com-

pounds and mechanical devices used for the prevention of conception in addition to so called natural methods. The more important techniques are treated in several good modern handbooks by Dickinson and Bryant⁸, Cooper⁹, Matsner¹⁰, Konikow¹¹, Fraenkel¹², Stopes¹³ and others, as well as papers on chemistry by Voge¹⁴ and Baker¹⁵. In the modern clinics—of which there are now 130 in the United States—the technique preferred is a rubber vaginal diaphragm of Mensinga type smeared with a spermicidal jelly. In a follow-up of several thousand cases for two years or more the method has proved, when properly used, effective in 90.95 per cent of the cases¹⁶. The method is as harmless and aesthetic as any yet developed.

Commercialization of the sale of contraceptives is undoubtedly new in extent. Probably condoms have been hawked for centuries. It is reported that seventeenth and eighteenth century houses of prostitution were veritable arsenals of them. What we are faced with now, however, is social control over a business that has grown by leaps and bounds. In some European cities sheaths are sold in slot machines and the rubber-shop windows of Charing Cross, London, are notorious for rather objectionable displays and business methods.

The enormous circulation of birth control literature in the nineteenth century prepared the public mind for clinics for the poor. Dr. Marie Stopes opened one in London in 1921. This was the first in the British Empire though not the first in the world. Dr. Aletta Jacobs had opened one in Holland in 1881 and Margaret Sanger one in Brooklyn in 1916. There are now 130 in the U S A and perhaps 1000 in the world.

One need not labor the point that in western societies in the past few decades there has increasingly been going on a liberalization of medical opinion. Collective votes and summaries of medical symposia have tended more and more to take the view that if the medical profession does not control the movement, quacks and commercializers and ignorant laymen will. Significant is the fact that Dr. Abraham Jacoby in 1912 and Dr. William Allen Pusey in 1924 in their presidential addresses before the American Medical Association supported contraception. Virtually all the clinics in the United States are now guided by competent medical boards responsible to no one but themselves for the medical side of the work. Even a propaganda organization like the American Birth Control League can boast of an unusually competent medical advisory board containing important names.

What are the more direct and immediate implications for medicine that the history of contraception teaches? (1) The desire for prevention is so universal it cannot be uprooted. At best it can be guided. (2) If the medical pro-

fession does not guide the movement some one else will (3) Birth control has survived nearly two thousand years of religious condemnation (by Christianity at least) and has grown increasingly strong This might suggest that much of the lingering opposition is futile (4) The immediate task of medical science is to improve our knowledge by more research Improving techniques is more important than refining indications (5) If the medical profession accepts medical indications but rejects the social and economic indications it will fail to see its problems whole (6) If the knowledge is carried to extremes in some quarters the medical profession must view it with tolerance and understanding The desire for control may be carried too far soon after freedom is won because any social force, once it gathers momentum, tends to go beyond the equilibrium point until new forces check it and restore equilibrium If we listen to the hot-heads, to the panic stricken, we will most certainly act unwisely Every new invention is open to abuse But we do not advocate illiteracy because some people may forge checks

What will be the long run effects socially of diffused knowledge of contraception? No one knows But some results are more probable than others Northern and Western Europe and the United States will have a stationary population in a few decades That is certain and there need be no alarm about it The rate of population increase of the last century was unique in history and abnormal Diffused contraception should reduce the abortion rate and the death rate from certain diseases Other factors remaining equal, it should raise the standard of living, soften some of the worst aspects of poverty, reduce the potency of one of the causes of war—population pressure on resources (e.g., Japan and Italy) It should have many other socially desirable effects, but, of course, it is no panacea There are reasons for believing that in the long run it will be judiciously used rather than abused

If contraception has, when wisely employed, the medical, social and economic advantages its supporters allege, we ought to put it in its proper place as a phase of preventive medicine and public health Such a position is not radical It is the attitude of classical medicine It is the view of some of the greatest physicians of all time From the first, contraception has been supported by the important men in medicine

Once the democratic process, initiated by Francis Place, is complete, it is difficult to conceive of mankind giving up its newly-gained knowledge Then one more battle along the front of preventive medicine will have been won When this day arrives, let us not forget to honor the pioneers, many of whom suffered that light might shine in dark corners If con-

traception has permanent value in modern medical technique, as I think it has, the least we can do is humbly to lay a wreath of respect at the feet of the great physicians, who, in times past, have preserved and enriched the noble tradition of antiquity

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INFESTATION WITH DIPHYLLOBOOTHRIUM LATUM FISH TAPEWORM*

BY ENSIO K F RONKA, M D †

THE present report dealing with a case of fish tapeworm, *Diphylllobothrium latum* infection, is presented as additional data to the study of this parasitic infestation in Massachusetts

The fish tapeworm belongs to the Cestode class of the Platyhelminthes or flat worms. The fish tapeworm spends its larval stage in the muscular tissue of fresh water fish, its adult stage in the human intestine. The adult form has lost all trace of a digestive tract and absorbs food from the intestine of the host all over the surface of its body. The adult tapeworm existing in the intestine of its proper host is divided into a "head" or scolex and numerous segments or proglottids. The latter are self-fertilizing and contain enormous numbers of eggs. The proglottids as they "ripen" break off from the tapeworm and are discharged from the intestine. Each egg or embryo is protected by a tough capsular covering. When eaten by another host of the proper species the tough shell is dissolved. In the new host the embryo lodges in the organs and tissues and is conveyed from these locations by the lymph and blood streams to selective tissues. Here development takes place with the formation of the larval or bladder worm stage. At this time the "head" or scolex with its suckers is also formed. The parasite remains in this stage until the tissue is ingested by a new host. The head is the only part to survive the process of digestion. It attaches itself by means of its suckers to the wall of the intestine, where it proceeds to develop new segments. The growth region is the area distal to the neck, the neck being the attenuated portion behind the scolex or head. The head itself is small and spatula-shaped. The freshly expelled proglottids are ivory colored. These are continuously proliferated posteriorly in a tape-like ribbon and thus expelled from the human intestine. Development of the immature segments occurs distally. The process of egg production is initiated in the mature segments. These now become gravid segments, i.e., those in which the uterus has become elongated and twisted back and forth upon itself in the characteristic "rosette" pattern, in order to accommodate the eggs. Mature and gravid segments together occupy about four-fifths of the length of the worm. Each mature proglottid is provided with both primary and secondary male and female reproductive organs.

The eggs of the *Diphylllobothrium latum* when

discharged from the parent ovum are still immature, but are provided with abundant yolk cells to nourish the enclosed embryo until it develops. These eggs are broadly oval in shape. The period of development which occurs in water, i.e., in diluted feces, varies from three to five weeks, depending upon the temperature. The hexacanth form embryo provided with ciliated epithelium makes its escape from the eggs through an operculum and swims about as a so-called plankton organism. This free swimming larva is ultimately ingested by certain minute cercopepod crustaceans. The larva does not remain long in the intestinal canal of this first intermediate host, but migrates into the body cavity where in the course of two or three weeks it is transformed into an elongated oval object, the procercoid larva possessing three pairs of hooklets on its caudal appendage. A single crustacean may have two such larvae developing within it. If a plankton-feeding fresh water fish ingests the infected crustacean, the larva is set free in the stomach of the fish, penetrates its wall in the course of a few days and wanders through the body cavity into the flesh and connective tissue where it becomes transformed into a Sparganum or plerocercoid larva. This larva may multiply itself several fold by asexual methods within the second intermediate host.

Various fresh water fishes, particularly those of lakes and mountain streams, may serve as second intermediate hosts of the infection. Among these the following European species have been incriminated: the pike, the perch, the salmon, the lake trout, and the Japanese rainbow trout, in northern America, the northern pike, the sand pike, and others. Man contracts the infection on consuming insufficiently cooked flesh of the infected fish. The worm proceeds to develop within his intestinal tract and matures in five or six weeks after exposure, at the end of which time eggs first appear in the feces.

CASE HISTORY

Mrs. E. L., aged 28

Chief complaint. The patient passed "ribbon like worms." She also had intermittent low abdominal cramps.

Present illness. The patient's attention was called to the existence of the worm by the passing of the ribbon like object. This happened twice within the past two years. The present illness actually extended back to her childhood when at the age of nine she first remembered of having passed worms. She had had some form of treatment for this condition at that time.

Past history. The patient was born in Finland. She had lived in the United States for the past ten

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years, her first residence in this country being in Medford, Massachusetts. Her first summer was spent at West Barnstable, Cape Cod, at the shore of a fresh water lake. While there an out-of-doors privy was used. Fresh water fish were eaten but she did not recollect how these fish were prepared. She also lived for some time in Boston and Hamilton, Massachusetts. Several of the following summers were spent in touring the New England states and Pennsylvania in an automobile and camping out-of-doors. She married in Brooklyn, New York, where she lived for a short period. In 1930 she moved to her present residence.

Family history. Her father died from natural causes. Her mother was living, having resided in the United States for the past eleven years. She had passed worms in Finland, but none in this country. The patient had one brother in this country who had a fish tapeworm infection, but became parasite-free under treatment. Her husband and three minor children presented a negative parasitic history.

Physical examination. The patient had moderate tenderness throughout the lower abdomen. No palpable masses were evident. This tenderness disappeared entirely after expulsion of the parasite.

Nervous and mental manifestations. Amongst a large list of disorders that may result from parasitism she presented only some slight pruritus of the nose and anus and numbness and tingling of hands and feet.

Manifestations in the Digestive Tract

Classical Symptoms	The Patient
1 Total or partial lack of appetite	1 Partial lack of appetite
2 Salivation increased.	2 Salivation increased
3 Ructus pyrosis nausea epigastric distress and pain	3 Nausea and low abdominal pain
4 Sensation of pressure or of strange movements	4 Present.
5 Colic and crisis like attacks	5 Absent.
6 Vomiting	6 Vomited twice
7 Constipation or diarrhea	7 Constipation.
8 Stomatitis glossitis	8 Absent.

No gastric analysis was done on this case. Stools contained ova of *Diphyllobothrium latum*.

Manifestations in the Blood

Classical Picture	The Patient
1. Number of erythrocytes decreased or normal.	1 4 200 000
2 Hemoglobin concentration somewhat diminished	2 Tallqvist 80% Haden Haussner 85%

3 Color index slightly heightened or normal	3 1 plus
4. Appearance of erythrocytes normal or enlarged	4. Normal in appearance
5 Leucocytes generally slightly decreased in absolute numbers	5 6,300
6 Differential count may not be altered	6 Polymorphonuclear neutrophils 64% Lymphocytes 30% Endothelials 4%
7 Inconsistent eosinophilia — generally not associated with <i>Diphyllobothrium</i> infestation	7 2%

Treatment

Filix mas (male fern) was used. She expelled about three yards of the worm consisting of proglottids with a centrally located brown uterus. No head was found.

Follow-Up

Several stool specimens examined since the treatment have been ova negative. The patient had gained weight, her appetite had improved and she had gone through a normal, uneventful pregnancy.

RÉSUMÉ

1 This patient, though she harbored the fish tapeworm in her intestines, suffered no ill effects from the parasite.

2 She presented a variety of clinical manifestations without anemia.

3 Her functional disorders were referable to the alimentary tract.

4 She exhibited a familial tendency of parasitism.

I wish to acknowledge the kind assistance given to me in the preparation of the above article by the Department of Pathology and Bacteriology of Boston University School of Medicine.

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VERMONT STATE MEDICAL SOCIETY

THE FUNCTION OF THE GENERAL PRACTITIONER
IN PUBLIC HEALTH WORK*

BY HOWARD W HAGGARD, M D †

I DID not construct or even choose the title of this paper "The Function of the General Practitioner in Public Health Work", it was contributed by the secretary of your society. Now a gift is above criticism in public, but not above critical inspection in private. And so in that moment which comes to all of us when we try to think of something appropriate to the title, I took this one apart word by word in the hope that a hidden inspiration might come tumbling from between the words. But all that I found there was a query. And that query is this: What is a general practitioner? And whatever he may be, what is his especial relation to public health work?

If there are such beings as general practitioners, there must be, in distinction, special practitioners. Nor is the specialist a new development in medicine. The Greek, Herodotus, the father of history, nearly a contemporary of Hippocrates, tells us with very doubtful veracity that among the ancient Egyptians there were no general practitioners, but instead only specialists, each of whom devoted his attention exclusively to a single symptom of a single disease.

It is, however, of the period of Grecian supremacy that we can speak with more certainty of the distinction between the general practitioner and the specialist. Hippocrates was a general practitioner, so also were his followers. But there were specialists in those days. Then, a specialist was a practitioner who performed such medical functions as were improper or undignified for the general practitioner to undertake.

You will recall in the oath, older than Hippocrates but named for him, that cutting for the stone was not to be done by the general practitioner and was to be relegated to men who did such things. These men were specialists.

Nor did this attitude die with the Greeks, it was carried into Arabic medicine and intensified there especially in regard to surgery. Thus when Arabic medicine in turn was carried into Europe, we find the distinction persisting. Specialists, such as operative surgeons, were of a low class compared with the general practitioners. Surgeons were barbers. Even the great Paré of France, on occasion, wielded the razor

and he did those menial things, such as operative surgery, which a reputable general practitioner would have refused to do.

Somehow, somewhere, the ancient tradition has changed a bit and we find surgery now a reasonably respectable occupation, even a dignified one. There was a time when ophthalmology was the province of itinerant quacks and mountebanks, when obstetrics was an exclusive prerogative of old women whose only requisite before the law for their specialty was to keep their finger nails trimmed. There was a time, too, when laryngology was practiced only by singing teachers. All of these specialties have now become respectable and we find even the general practitioners occasionally backsliding into specialties which were once beneath the dignity of any respectable medicine man, e.g., any general practitioner.

Tradition and custom, in some regards may have changed. The specialist may have become respectable, even exalted. In its more fundamental aspects, tradition has not altered. Back in the days in which medical traditions were created the specialist dealt exclusively with one phase of the individual's activity. The scope of the general practitioner was wider, he dealt with nearly every phase of every man's activity. He dealt with society as a whole and it is with society as a whole that public health is concerned.

We are prone to think of public health as a development of modern science. Truly its greatest demonstrable triumphs have come from the science of sanitation developed during the last hundred years. And during the same period much organization has been brought into public health endeavors. But public health work is more than sewage disposal, water purification, food inspection and quarantine. Such procedures, however valuable they may be, are merely means to an end. It is only the end that is Public Health itself. Public Health is the protection of our people against all environmental influences which may exercise a detrimental effect upon their physical or mental well-being. It is strictly a social field, essentially a philanthropic one, and one imposed upon the general practitioner as a duty by tradition from time immemorial. To him it is an obligation, as vague in its delineation perhaps as the very ethics by which the physician guides his conduct. Both arose from the same sources, both are nourished by the soil from which religion sprang. By tradition medicine is not a busi-

*Read at the Annual Meeting of the Vermont State Medical Society in Barre Vt. October 6 and 6 1933

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ness, nor even a science it is a calling, a social calling. It is only when the social duty of the physician is sensed by him and felt by the public that medicine and the physician acquire their due and proper prestige. Prestige is indispensable for the full display of the measures of public health.

Public health is not new, it is as old as the medicine man and he dates, in turn, to prehistoric times. The tradition which established the social duty of the physician is carried forward through him. The medicine man of primitive peoples was primarily a socially-minded individual. His function was to control all matters affecting the public weal. There were, on the one hand, the unseen powers that actuated the universe and, on the other, the ordinary visible people. Between these two the medicine man stood as mediator. His position was one of vast importance, of vast influence, and of vast responsibility. Because of his acceptance of the social duty he was held in the very highest prestige by his fellow men. He was a public-health worker.

With the advance of the centuries the methods of public health work have altered. Many of the duties undertaken by the early medicine man have been handed over to specialists. Wisely has he relegated his meteorological and climatological functions to perhaps better hands. The man of medicine of today fortunately is not called upon to predict rain, or interpret the blowing of the wind. Furthermore the physician has relinquished the whole field of religion which he once controlled. That step, the separation of medicine from religion we credit to Hippocrates. Whether it was a wise step I do not know, in view of subsequent developments I rather doubt its wisdom for the consequences of the separation were far-reaching. It tended to make the physician less active socially. As a result of the separation only the physical ailments of men were allotted to the physician, the behavioristic ailments of men and society were included in religion. An arbitrary division, one which has no real existence was created between the flesh and the mind. Public health, as I conceive it, does not stop with the physical ills but carries over as well into the field of social ills.

If you want to see the physician as the social arbitrator between men and their environment in civilized surroundings you need turn back only one or two generations to that cherished character now growing obsolete and about whom wishful myths are already developing, the old family doctor—a man who exerted a great influence in town life, who appeared as a paragon in medical matters, as an oracle on all subjects social and political, who was a father confessor who was a man after whom grateful mothers proudly named their offspring and whose limitations were known only to his wife and the town druggist.

This man was a social force. But he did not attain this eminence by science, nor yet by confining his activities to the physical ailments of the individual patient. He was active socially, he was a man of forceful personality, he took part in politics, and if I remember correctly there were six medical men who signed the Declaration of Independence who turned their keen and trained intellects to the problems of the public welfare. Politics is today a field which fails to attract the majority of physicians. No longer are the names of the men of the medical profession found heading the lists of great and beneficent public movements. We are inclined to look back upon the old family doctor with his interest in society as one of the cherished pioneer, but rather naïve, institutions of a rugged and growing country, and class him with the horse-drawn carriage and the oil lamp, the family circle about the open fire and the prayer meeting.

With the methods in medicine that modern science has put at our command, we look in tolerant pity at the crude measures he used in diagnosis and treatment. We smile at his sallies into political activities, his concern with the domestic and social aspects of his patients. But even as we smile in mild contempt we feel a real envy for the prestige which this man held, the social control which he exercised over the community, the respect which he commanded.

His patients did not turn from him to quasi-healers, they did not embrace the healing cults, they did not flock to quacks, nor did they adopt medical fads and fancies. The public respected this man of medicine and in respecting him respected medicine. No suggestion was brought forward that the old family doctors should group together into a subsidized, socialized form of practice to become servants rather than leaders of the community. They would have looked upon such a suggestion as an insult.

These undesirable conditions came about only after medicine had much more to offer to the patient and to the public than it had in the days of the old family practitioner. It is common knowledge that during the last eighty years medical science has made amazing discoveries for the betterment of health and for the prolongation of life. Nearly all methods of so-called preventive medicine have been developed within this period.

But while the physician has advanced to overcome one disease after another, and made his science better able to fill an important function for public welfare, the prestige of the physician and the regard in which medicine is held by the public have not increased correspondingly. Indeed they seem to have declined.

Now this change in public regard has driven the physician from a position of social superiority to that of a mere scientist, and to the

American public the scientist is not a god, but only a servant. The consequences of this change go beyond matters of mere personal pride. They bring an obstacle to the advancement of medicine. If medicine is to progress, if it is to carry out its work of public health, it must be viewed with respect and sympathy and admiration. It's well enough to point to the triumphs of sanitation and show how deeply ingrained these things have become in the very minds of the people. But, as you point to that fact, let me point to another, today the vast majority of men and women die prematurely, they die of diseases which are controllable or preventable by methods already available, not sanitation or other impersonal methods, but those requiring that active and personal cooperation of patient and physician which is essentially a social aspect of medicine and is just as much public health work as sanitation itself. The statistics today show that the general practitioner has failed in this function in public health work. And one of the causes of this failure is the decline in the prestige of the physician.

Many explanations have been offered to account for it. It often is suggested that the physician in becoming scientific has taken the alluring mystery out of medicine. There was a time not so many centuries ago when the bubonic plague that so ravaged Europe was looked upon with mingled regard as an affliction from God and the contamination of the air. Under direction of physicians men prayed to the gods for relief and burned gunpowder in the streets to purify the air. Modern science has shown the disease to be due to a bacterium carried from rats by fleas. Prosaic you say. From great and powerful agencies to vermin. The mystery is gone and with the mystery the importance, the prestige of the physician. I, for one, do not believe so. It is an argument as specious as the one supporting the belief that the prestige of the old family doctor was inherent in the mystery of the bad Latin in which he wisely disguised his prescriptions.

Let us analyze a little more closely what has actually been going on to develop the gap which lies between the old family doctor and the modern general practitioner. See wherein the latter has failed to carry on the tradition of public health, the tradition that he was the supreme mediator between man and his environment. And when we have completed our analysis we shall find simply this: the public has not changed but the physician has. In becoming a modern scientist he has become less socially-minded, and, although vastly better equipped technically to do so, is less able to carry out his true function in public health work, and he desires less to do so.

The great change commenced in the latter part of the nineteenth century. At that time

the sciences of mathematics and physics and chemistry were for the first time applied intensively to the elucidation of medical problems. Since then the progress made in developing new methods of diagnosis, new methods of treatment, new methods of prevention has been stupendous.

Medicine as a science has developed to an extent never before even dreamed of. But, gentlemen, while medicine altered, human nature did not change correspondingly. The real and fundamental nature of the patient whom you treat today is the same as that of the patient whom the old family doctor treated two generations ago. His problems have altered with the change in his environment, but they are as serious and as personal to him as they ever were.

Science has come in and it has told us much, but science has never and probably never will evaluate with precision the full ramifications of the human mind, of human personality, of human nature. And so long as these things remain beyond the control of the measures of science, to that extent medicine fails as a science.

In the first flush of the triumphs of the application of science to medicine, it appeared that all the problems of medicine were to be answered and that medicine at last was destined to become as exact and impersonal as engineering. But medical education changed, it adopted the precise methods of science. It built its structure on the laboratory as a foundation. Premedical education changed. For our medical schools we selected men who excelled in the laboratory sciences. We did not select men to go into medicine because of a driving desire to help mankind, socially-minded men. Quite the contrary, in the medical schools the students were trained too often by great scientists and not by great practitioners, there are few great scientists who have been great practitioners. Attention centered almost exclusively upon the physical manifestations of disease. Consequently we have developed many bedside pathologists, interested in diagnosis for the sake of diagnosis, but whose only contact with the patient is through the foot of rubber tubing on the end of a stethoscope.

And human nature cannot be interpreted or controlled through the restricted lumen of a rubber tube. Neither can social problems of medicine be solved in a flash over a Bunsen burner or even in the seclusion of a committee room. The social problem of medicine is solved by social contact.

I hesitate to say it, but the truth is, I doubt whether we now have many general practitioners, particularly in our larger cities. Rather they who occupy something of the position of the general practitioner are now inclined to call themselves internists. They are to all in-

tents and purposes specialists. It almost seems to me that we have returned to the ancient Egyptian situation where every physician was a specialist.

I have perhaps wandered far from my topic "The Functions of the General Practitioner in Public Health Work." I have indicated the functions that tradition assigned to him, I have enumerated some obstacles that have been put in his way. So far my words have been of destructive criticism. What can I say in a constructive vein? Wherein lies even a partial solution of the difficulty?

I think it lies in education. Yes, in medical education in part. But for another great part in the education of the public. In that direction lies the present work in public health. It is not in the laboratory, not in the development of new methods of treatment, cure, or prevention, but education,—education to a better understanding of medicine, to a fuller application of the measures already available. And such education means that the physician must leave his office sometime and become a factor in public affairs. Not to remain a recluse of the hospital ward or operating room, busying himself exclusively with the physical infirmities of the individual man, but, in the broader interests of mankind, giving his talents to public affairs. Fundamentally our public is guided by what it sees and not by what it hears. It will turn a deaf ear to the praise of medicine sung with the sweetest notes. But it will be influenced, and will believe and appreciate the importance of medicine when it sees the physician entering into the activities of the community and becoming a leader there.

DISCUSSION

PRESIDENT ALLEN As I said this morning there are no people appointed to discuss these papers but I certainly hope this one will be discussed. I am going to ask Dr. Dalton to open the discussion.

DR. DALTON Dr. Ricker told me that Dr. Haggard would present a very wonderful paper and his prognosis has proved to be correct.

The doctor has said a great many things I would like to say if I had the ability to do so. In my experience most doctors are public health workers. They are so whether they wish to be or not, and the true reason is that the public has received so much medical information through the doctors and through articles in papers and journals that the doctor himself must maintain his efficiency in public health matters and give advice respecting preventive medicine.

I have had the privilege of meeting men from different parts of the country, and learning of the attitude toward public health work, but I have yet to find a state where physicians are as coöperative in public health work as they are in Vermont, and that is very much appreciated.

While the private physician must necessarily engage in preventive work there must be some public health department supported by the state or town or city in order to take care of those things which affect the mass rather than the individual that is a public function. I appreciate this paper and have en-

joyed it, and hope Dr. Haggard will come and talk to us again.

DR. WHITNEY It seems to me that when a physician is called to a home to treat a case, he should improve the opportunity to look around and see if some other members of the family may not need medical oversight or supervision. His apparent interest in so doing will add to his prestige and it will be along the lines of preventive medicine. I think that this is one of the opportunities that the younger men do not appreciate. Too many of them are apt to look upon medicine as a commercial venture rather than a humanitarian vocation.

PRESIDENT ALLEN I should like to hear from some of the younger members as well as the gray-headed ones. Perhaps we have become so impressed with the truth of what Dr. Haggard has said that we think it admits of no arguments and requires no discussion.

I wonder if Dr. Haggard realizes that probably in few states at state society meetings, could he talk to so many representatives of what he considers the fast disappearing school of old-fashioned general practitioners. Vermont has a lot of them and she is very proud of them. I wonder too, if the doctor realizes that in 1777 when Vermont proudly announced herself by declaration to be a free and independent nation, that that declaration was signed by four doctors. So in those days and I think in the present, the doctor played, and still plays, an important part in the social life of this little state.

MISCELLANY

VERMONT DEPARTMENT OF PUBLIC HEALTH

JANUARY, 1934

During the month of January 200 cases of chicken pox, 4 cases of diphtheria, 240 cases of measles, 50 cases of mumps, 82 cases of scarlet fever, 10 cases of typhoid fever, 3 cases of undulant fever and 187 cases of whooping cough were reported.

The Laboratory of Hygiene made 1,487 examinations in January, classified as follows:

Examinations for diphtheria bacilli	122
“ “ Widal reaction of typhoid fever	45
“ “ undulant fever	32
“ “ gonococci in pus	129
“ “ tubercle bacilli	202
“ “ syphilis	495
of water chemical and bacteriological	15
“ “ water, bacteriological	192
“ “ milk, market	140
“ “ milk, submitted for chemical only	1
“ “ milk submitted for microscopical only	17
“ “ foods	1
“ “ drugs	2
“ “ for courts autopsies	1
“ “ courts, miscellaneous	28
“ “ miscellaneous	64
Autopsies to complete death returns	1

Twenty-nine cases of gonorrhea and twenty-six cases of syphilis were reported to the Division of

Communicable Diseases Six hundred and seventy three Wassermann outfits and 481 gonorrheal slides were distributed

The nurses of the Poliomyelitis After Care Division made seventy one home visits to patients, consulted eight physicians and made ten social service calls in January. Four patients were admitted to the Audubon Hospital, three patients were discharged and one patient was discharged from the Children's Hospital in Boston. Fifteen pieces of apparatus

were altered and fifteen orthopedic corrections made to shoes. The vocational worker reports sales in January amounting to \$106.70.

The State Advisory Nurse visited several towns to assist community gatherings and P. T. A. meetings. Much of the time this month was devoted to the Civil Works Service project for giving work to unemployed nurses. Two hundred and seventy-two notifications of birth registrations and 1,499 pieces of literature have been sent out.

MEDICAL PROGRESS

PROGRESS OF GASTROENTEROLOGY IN 1933

BY A. E. AUSTIN, M.D.*

THE usual investigations with regard to secretion, pathology, etiology and treatment have been pursued in 1933 and will be taken up under the organ in question.

STOMACH

Hofstein¹ has investigated the action of insulin on gastric secretion by means of fractional withdrawal with a permanent tube.

First, all the secretion which the stomach contained is withdrawn and then the patient receives an intramuscular injection of 16 units of insulin, in order to avoid the possibility that the presence of the tube alone could augment the acidity of the gastric juice, controls without the use of insulin, were employed, in no case was the acidity increased.

In all instances the insulin one hour after injection caused a marked increase in the hydrochloric acid with an extreme sensation of hunger. In those affected with anacidity or achylia, the insulin produced the sensation of hunger but no hypersecretion.

Since histamin has been used to such an extent in arousing the secretion of gastric juice in those suffering from achylia, Szmemo² after four unfortunate experiences in its use warns against a too indiscriminate employment of it. His patients in whom it had been injected suffered from headache, extreme suffusion of the face and one, even an urticaria and shock.

He does not regard the histamin test as of any value as distinguishing between disease accompanying achylia, i. e., gastritis and those diseases causing achylia, such as essential anemia and cancer.

Histamin gives no information as to the character of the achylia, its severity or prospects of restitution of the secretory powers of the stomach. Histamin can be replaced by insulin or substances to be ingested like alcohol or caffeine and the latter ingested substances give a

much better view of the cause and severity of gastric anacidity.

Pfaffenberg³, noting the decided relief obtained by those afflicted with "hyperacidity" in the use of alkalis and absorbent materials, made tests with different forms to determine whether the neutralization was temporary or whether the gastric secretion was actually reduced by this means.

With the tube constantly in the stomach after 300 cc of tea were taken, portions of gastric juice were withdrawn at intervals of ten minutes, until the normal acidity was determined.

Then in the same individuals in conjunction with the tea, the more common of the heavy alkalis were taken and the acidities compared with the former.

In every instance there was a temporary fall of the acid curve, followed almost immediately by a return to the former peak, hence these alkaline substances do not diminish permanently the acid secreting power of the stomach which seems bound to maintain a certain level of acidity. The therapeutic significance of these heavy alkalis is not changed by these experiments, they serve only for temporary relief.

Secher⁴ has studied the relation in 33 men and 149 women, of the so-called small heart or cor pendulum and gastroptosis which are so often found in the same individual. These were all of the narrow-chested, slim type, no woman was over 26 and only three men over 30, of 55 women under 30 years of age, 42 had never borne children.

Hence the condition described must be regarded as congenital. Upon measurement of the transverse diameter of the heart, it was found that practically all of the young women were far short of the average.

Hence the author concludes that a small heart and gastroptosis are generally found in the same individual. The men with this syndrome are always underweight as compared with their height and remain so during subsequent years.

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As age progresses, the narrow chest enlarges and at 40 or after, the heart reaches its normal horizontal dimensions, many of the possessors of the ptosed stomach have no gastric symptoms. Smeke⁵ calls attention to a combination of achylia or hypochlorhydria and lack of hemoglobin in the erythrocytes but without the gross change in size of the globules as is found in essential anemia with the accompanying increase of urobilin in the urine and nervous symptoms such as paresthesia, loss of reflexes, etc.

This condition, or syndrome, or Biermer's disease is benefited both by liver and arsenic by which the hemoglobin of the blood as well as the hydrochloric acid of the stomach is increased.

Iron has also proved most efficacious in combating this disease, but must be used in large quantities, as three to five grams daily.

That foods contain enough chlorine naturally to produce active gastric juice has been proved by Unverricht⁶.

Patients were fed from ten days to ten weeks on this salt-free food, viz, raw fruit, vegetables, eggs, milk, cream and olive oil.

From time to time gastric contents were withdrawn by the fractional method and titrations for hydrochloric acid and tests for pepsin were made. The free and total acids of the gastric juice remained normal as did the pepsin, even after long periods, on this diet.

Hence he thinks that it is proved that the hydrochloric acid of the gastric juice is not dependent on the sodium chloride added to food. Hence, whenever the accumulation of sodium chloride in the body is too great, this diet is advised.

Reschke⁷ urges more frequent use of surgery in checking severe gastric hemorrhage from ulcer, at least 5 per cent will die without operative intervention and if the operation can be performed within 12 hours after bleeding begins, the chances of recovery are good.

Another great aid according to the author is a preliminary transfusion which sometimes in itself checks the bleeding, but, if not, puts the patient in a vastly better condition for the operation.

That transfusion and resection will save many patients, otherwise doomed, is the conclusion of the author.

Morton⁸ analyses the records of peptic ulcer in the University Hospital at Charlottesville, Va. which deals with a farming population including some Negroes whose diet is generally coarse and of nonalbuminous character, and compares the medical and surgical treatment of peptic ulcer.

The material comprises 220 cases of duodenal and 66 of gastric ulcer, in more than half of whom symptoms had persisted more than two years.

Medical treatment was employed in 196 cases

and surgical in 90. Six deaths occurred in the hospital among those treated medically and eight of those surgically treated. Of those discharged, a total of 272,190 had had medical and 82 surgical treatment. A questionnaire sent to each of these produced 164 replies, most of which came from patients who had been treated from two to twelve years before. Of the medically treated, about one half living had obtained satisfactory results, of those surgically treated all of those with gastric and three-fourths of those with duodenal ulcer had obtained excellent results. This shows that there was definitely more complete relief from surgical than medical treatment.

Furthermore, those medically treated were compelled to indulge in a fairly strict diet and employ alkalis while the others ate pretty nearly what they chose. Moreover three of the former group died of gastric cancer and many had eventually to return to the hospital for operation.

Konjetzny⁹ combats the possibility that the gastric juice has the power to corrode or digest the gastric mucous membrane. He is quite convinced that the elimination of toxic material by the stomach starts the gastritis and quotes two cases where this happened, one of psoriasis and one of an appendiceal abscess.

Such a gastritis may lead to polypous formation and, if about the pylorus, obstruction may take place and an operation prove necessary. He is also convinced that many, if not all, gastric ulcers are preceded by this condition of gastritis. Gastritis, too, may cause symptoms so similar to those of gastric or duodenal ulcer that mistaken diagnoses are made.

Disturbed by the fact that some of his patients became infected and died of peritonitis when every possible antiseptic precaution had been observed, von Haberer¹⁰ has sought at the autopsy for any other sources of infection and thinks he has found it in the lymph ducts which must necessarily be severed in any extensive abdominal operation.

In 1041 resections of the stomach and duodenum, this form of infection has occurred three times so that its rarity is established.

The author's opinion is that, when any suspicion of infected lymph ducts exists, the site of operation should be surrounded by drainage tubes or wicks. These should be left in the wound and no complete closure attempted.

Basing conclusions on 131 duodenal, 45 gastric and 5 gastrojejunal ulcers, Scrotson¹¹ proceeds to analyze the history of these cases and offers suggestions for treatment. From statistics it is proved that perforation of a peptic ulcer is much more likely to occur in males than females, and the existence of previous symptoms of ulcer may be from two weeks to 40 years. The agonizing pain and boardlike ri-

gidity of the abdomen, together with pain in the shoulder tip, usually differentiate the perforation of a peptic ulcer and that of the appendix.

Of the 181 patients operated for perforated peptic ulcer, 31 died making a mortality of approximately 17 per cent. It was found that the deaths from perforated gastric ulcer were more than twice that of duodenal. The further history of 92 of these individuals three and one-half years after operation showed that 42.39 per cent had no further symptoms, that 38.04 per cent had slight discomfort and 19.57 per cent had severe symptoms or a subsequent operation.

It was also shown that suture plus gastrojejunostomy gave a much lower mortality than the former alone. The author urges early operation and restricted diet with alkalis long after the operation.

Ritter and Keller¹², in order to verify the belief that there is a peculiar tendency in certain families to acquire ulcer of the stomach, have examined 378 cases of the same and found in eight, or 2.12 per cent, who were operated and diagnosis assured, a history of other members of the family who had suffered from ulcer.

In five families it was found that three to five members ranging through three generations had suffered from gastric or duodenal ulcer. The authors are inclined to attribute this frequency of ulcer in these families to a neurotic origin, since neurosis almost always accompanied the ulcer.

Hyperacidity while found was not a general characteristic in all the families, nor was there any uniformity in the site of the ulcer. On account of its rarity, this familial disposition to ulcer is not regarded of very great importance.

DUODENUM

Baumstark¹³ reports two cases of duodenal diverticulum and makes suggestions as to means of diagnosis. First as to symptoms, both patients complained of periodic pain in the upper abdomen and especially in the right or left hypochondrium. Relief of pain occurred on change of position as lying on the abdomen or on the right or left side. Attacks of fatty diarrhea, abdominal distention, loss of flesh and often severe headaches occurred. When these symptoms are present and no other cause can be found in the abdomen, recourse to roentgenology should promptly be had. Associated inflammation of the pancreas probably accounts for the fatty stools. Treatment should be largely dietetic and recourse should be made to surgery unless complications are present.

Hammelmann¹⁴ calls attention to the difficulty of diagnosis of granulomata of the duodenum and describes an invagination ileus from a lympho-granulomatous tumor in the upper jejunum. This man of 48 had been under treat-

ment for a year on account of a supraclavicular tumor which was found to be a lymphogranuloma.

There was no digestive disturbance until the end of the year when the patient was suddenly attacked by abdominal crampy pains, vomiting with retention of stool and gas. A tumor was detected just to the left of the navel. An intense application of Roentgen rays was first tried and proving of no avail, operation was performed and 30 cm. of duodenum was found invaginated into the jejunum at the apex of which was a tumor, the size of a hen's egg which proved to be a lymphogranuloma.

The growth with 40 cm. of intestine was resected. Recovery from the operation was uneventful but the patient afterwards died of a lesion of the cord, probably of a similar character, with complete paralysis of the lower part of the body.

PANCREAS

Sebening¹⁵ first emphasizes the relation of the biliary tract diseases to pancreatitis and explains the connection as either due to obstruction by stone at the ampulla of Vater which forces bile into the pancreatic duct or the entrance of bacilli. The history of previous attacks of gall stone colic confined to the right side and with the pain in the present instance extending to the left side and persisting there should arouse at once suspicion of pancreatitis.

In 80 per cent of all cases of pancreatic necrosis coming to operation at the Frankfort hospital, there was a history of previous gall stone colic. The fear that cholecystectomy may lead to pancreatic disease is dispelled by the fact that among 1284 cases of operation for pancreatic necrosis only four had previously had their gall bladders removed.

The most important thing is early operation as very severe cases often die within 24 hours of onset. The author emphasizes the importance of restriction of carbohydrates for at least a year in the diet of those surviving the operation.

LIVER

Farmakidis¹⁶ discusses a condition of the liver which demonstrates itself by gross enlargement, often without jaundice or known cause. After quoting six cases with history he divides the cases of enlargement of the liver into two classes, where the cause is known, typhoid, septicaemia, malaria, etc., and the unknown, in the latter class he places these enormous hypertrophies of the liver where the most careful examination fails to discover its etiology. Failing any laboratory verification, the author surmises that this enlargement is due to toxins produced by bacillary invasion. He further thinks that this condition is an entity and should be granted a place in pathology.

Barchasch¹⁷ reports two cases of severe jaun-

dice and shows the difficulty of diagnosis, the one began as an ordinary catarrhal jaundice and three and one-half weeks later assumed all the characteristics of acute yellow atrophy which was shown at autopsy, the second case of severe jaundice began like the former but lingered and one and one-half months after the beginning of his illness acquired a marked ascites and an ordinary hepatic cirrhosis was established. The autopsy, however, showed both cirrhosis and acute yellow atrophy. From these cases the author draws the conclusion that for severe jaundice neither an angiocholitis nor obstruction of the ducts is necessary since bilirubin can be formed outside the liver.

The pathology of all forms of jaundice from catarrhal to acute yellow atrophy, is chiefly in the liver cells with physiochemical changes therein ranging from hepatitis to necrosis. Since so little is known about subacute yellow atrophy of the liver, this condition may be assumed when severe jaundice is present, accompanied by sudden ascites, hemorrhage and enlarged spleen though there is no disturbance of the nervous system.

Seide and Geller¹⁸ have studied 35 cases of primary cancer of the gallbladder to determine what influence, if any, the presence of gallstones has exerted on its causation. In 17 of those operated for supposed cholelithiasis cancer of the gall bladder was found, making 48.5 per cent.

It was noted that cancer associated with stones is much less common in men than in women, of these one half had suffered from gall-stone colic from one year to several years before the carcinoma was discovered while the others had had cholelithiasis only a few months. Their conclusions are that there is a close connection between the two diseases, that the percentage of women with this combination is much greater than that in men. In view of the fact that women are much oftener the victims of cholelithiasis, this speaks rather against the cancer being due to the irritation of stones and rather that the cancer aids the formation of stones.

The fact that two thirds of the patients experienced the pain due to stones almost coincidentally with the diagnosis of gall-bladder cancer, points to the cancer as primary and the stones as secondary.

Friederich¹⁹ reports on 1500 cases in which practically all the known tests, examination of urine, bilirubin in blood, liver function test and roentgenology were employed and compared with the results from the introduction of the duodenal tube. In 27 per cent of the cases no filling of the gall-bladder was detected though the dye was given intravenously, in only four per cent were positive stone shadows found, in 22 per cent negative stone shadows were detected and in 30 per cent both.

When these latter are found whether positive or negative, the author concludes that positive

diagnosis of cholelithiasis can be made and all other tests are superfluous.

When, however, no stone shadows are found, then an examination of the bile procured by means of the duodenal tube is necessary. The reflex was studied by the three methods, employment of peptone, magnesium sulphate and pituitrin with all methods the reflex was positive in 25 per cent and negative in 75 per cent.

The author's conclusion is that a positive reflex does not exclude the presence of gallstones while a negative reflex may have several causes of which a stone is one. In 54 per cent of the individuals examined, the gallbladder was not visible by cholecystography and in only six per cent of these could a duodenal reflex be elicited.

Among his conclusions are the following: the use of the duodenal sound alone cannot lead to a correct diagnosis of cholelithiasis, while cholecystography is much more valuable since it leads often to a positive diagnosis of stone in the gallbladder, the use of the sound should not be dispensed with as it often adds to the findings of roentgenology. Kopstein and Popper²⁰ have studied the nerve control of the gall-bladder by means of cholecystography. Such drugs as adrenalin, ephedrin, ergot, pilocarpin and atropin were used to either excite or paralyze the sympathetic or vegetative nervous system.

The first picture was taken 13 hours after the contrast material was ingested, the drug injected and 30 minutes later another picture taken. In every case the shadow remained of the same size so that it was impossible by any of these drugs to so excite or paralyze the sympathetic or parasympathetic nerves that their influence on the motor power of the gall-bladder was affected.

Then the same drugs were employed after the patients had taken the yolk of two eggs. After the use of ergotamine tartrate it was found that the motor activity of the gall-bladder was slowed and the fat stimulation (egg yolk) suspended. Atropin had no effect.

Hence from a practical point of view in the clinic, if we wish to check the motor activity of the gall-bladder, we should use ergot and not atropin.

In a mass of 15,000 autopsies Ehrmann²¹ has made a careful study of the incidence of cholelithiasis and gastric ulcer, of the former he found six per cent of all sections of men and 16 per cent of women. The incidence of gallstones increased very rapidly after the war, which fact he attributes to the large quantities of coarse fats taken by the people starved during the war.

These fats consisted largely of stale American bacon, a poor quality of lard and margarine. The existence of cancer of the gall-bladder and acute pancreatitis he regards as the result of gallstones and found a large increase in the number of the latter. Of 7000 patients

with ulcer of the stomach or duodenum, 800 came to autopsy

While men were preëminently the victims of ulcer before the war, the increase in women after it brought them almost to an equality. The site of these gastric ulcers is usually in the lesser curvature and their increase in women was undoubtedly due to the coarse nature of the food which was very bulky and had little nutritive value. Since the return of a normal diet the occurrence of these ulcers has been much less and the predominance of males has returned. During the activity of the ulcer a thickening of the mucous membrane of the stomach, and acute gastritis exists. This disappears after the ulcer is replaced by scar tissue. Ehrmann does not believe that ulcer becomes cancer except in rare instances. In fact he declares that ulcer protects one from cancer. From the statistics of the hospital, he found that ulcer was a disease of the lean or half-starved years and cholelithiasis of fat years, that is the return of prosperity.

APPENDIX

Thom²² distinguishes three forms of chronic appendicitis, first, chronic intermittent in which at intervals pain is felt in the right lower quadrant with relief between attacks, secondly, the remittent form beginning with a short sharp pain which becomes quiescent after a long period of rest followed by a return of the pain and, thirdly, a primarily chronic form with a constant dull ache over McBurney's point. In 28 cases in these categories in which roentgenology showed no filling of the appendix, or the shadow showed marked distortion, because of refusal of operation by the patient, the author employed injections of ten to twenty per cent calcium chloride in amounts of 10 cc at first daily and then every other day. After from ten to fifteen injections, the patient is usually free from symptoms. In general the x-ray showed no change in the pathological condition after treatment but in three cases an invisible appendix appeared in normal contour. By mouth the action of the calcium is much inferior to the intravenous administration.

INTESTINES

Hepburn, Eberhard, Ricketts and Rieger²³ collaborated in determining the temperature of the gastro-intestinal tract under normal conditions and then studied the effect of the ingestion of hot and cold foods and drinks, also that of the local application of cold to the abdomen, and various forms of heat.

The thermometer was introduced into the stomach, jejunum and sigmoid and its actual position determined by the fluoroscope. In 129 men, the average gastric temperature was 99.2°, in 128 women, the average gastric temperature was 99.4°.

It was also found that during the period of investigation varying from one-half to three and one-half hours, the temperature may vary in the same individual as much as 3.5°, the jejunal temperature was approximately the same as the gastric, the average difference being less than 0.1°. The sigmoidal temperature was always higher than the oral, on the average, by 2.9°.

With 250 cc of ice water taken internally, there was a rapid fall of temperature followed by a rise, rapid at first and then more gradual until a horizontal was reached, lasting at least ten minutes. This was regarded as the final change and was usually 0.2° below the temperature preceding the ingestion of the ice water. The recovery time averaged from 38.1 to 39.8 minutes. With 90 grams of ice cream, the graph was very similar to that obtained by the ice water except that the initial drop was not so great. The magnitude of the drop in gastric temperature was proved to depend upon the temperature of the ice cream and the speed with which it was eaten. With a cup of hot coffee, the gastric temperature rose rapidly, descended as quickly for a short period and then more slowly, the total rise varying between 4.2° and 17 degrees and the recovery time between 9.9 and 45 minutes. The application of hot pack, hot water bag, electric pad or infra-red lamp produced no change in the intragastric temperature. The application of an icebag to the abdomen produced a decided drop in the temperature of the stomach and upper intestine, but produced no change in the sigmoid temperature when applied to that part of the colon.

It has been well established that gastric secretion and motility are increased during the catamenia in women and hence such examinations at this time are faulty but Halter and Pape²⁴ have made a study of intestinal activity during this period.

Laying aside the subjective history in which it was found that twenty per cent of 191 women who complained of constipation returned to normal movements during menstruation, 15 cases were examined by the fluoroscope at six to twelve hour intervals during the menses after 80 grams of barium had been ingested. Of these, five showed little change of motility in the colon while eight showed a marked increase in motility while in two cases, peristalsis of the colon was lessened. For control, the same examination was made from twelve to fourteen days after the menstruation had ceased.

Two explanations are offered, first the ovarian hormone is in excess during the menses which acts on the muscles of the intestine, and secondly, a sympathetic contractility of the intestine such as exists in the uterus during the catamenia and childbirth.

Owing to the rarity of intestinovescular fistula, Willan²⁵ reports six cases of which one was

a tubercular adhesion between the small intestine and the bladder, one a perforative diverticulum of the colon, two malignant growths of the lower end of the pelvic colon while two others were urinary calculi ulcerating into the rectum.

In all cases passage of feces and gas through the urethra established the existence of this condition while other investigations showed the cause. All cases except cancers of the rectum were operated with successful results.

Ligat and Overend²⁶ call attention to the fact that the condition of volvulus of the pelvic colon is neglected in medical literature and report 12 cases. These may be divided into three types according to symptoms, first, severe and continuous constipation with some aching in back or abdomen, secondly, severe spasmodic pain and distention of the abdomen, and thirdly, an aggravated type of the former where we have distended veins and watery discharges, often blood-stained. The discharges after the pain which may be severe are the most distinctive feature of the volvulus.

The most satisfactory method of examination is the fluoroscope after an enema of barium and tragacanth by which the contour of the colon can be studied. The barium is then evacuated and a careful inspection of the mucous membrane is made. This is followed by fractional inflation of the colon by air to determine its anatomical relationships.

Ligat and Overend conclude that recurrent sigmoid volvulus is not a rare but a frequent cause of obscure symptoms.

The most satisfactory treatment after diagnosis is established, is removal of the redundant loop. If the victim is a bad surgical risk, colonic irrigation and a suitable diet with the least possible amount of residue must be adopted.

After emphasizing the difficulty of the diagnosis of tubercular peritonitis, Saegesser²⁷ offers a new aid to the clinical and other physical signs in the shape of roentgenological examination.

While ordinarily the ileum is free from the contrast material in from six to eight hours, in this disease it can be found many hours beyond this period. In 23 out of 36 cases studied, a laparotomy confirmed the diagnosis based largely on the x-ray findings. Another feature is the irregular distribution of the barium in the ileum some coils being fully distended and others empty. This unequal distribution is much more marked in proportion to the size of the

adhesions but even in the exudative form, this delay and unequal distribution are noted.

Only two conditions have been found which confuse these findings, cancer of the omentum and ileocecal tuberculosis.

Finally while this six-hour appearance is not always present in tubercular peritonitis and may appear rarely in other conditions, it is of the greatest assistance in establishing a diagnosis.

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CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F M PAINTER, A B, ASSISTANT EDITOR

CASE 20111

PRESENTATION OF CASE

A sixty-eight year old American caretaker entered the hospital complaining of jaundice, nausea and abdominal pain

For a month the patient had felt constantly fatigued but not really ill. At about the time when this sense of fatigue developed he noticed jaundice, which rapidly deepened in intensity for several days and then slowly began to diminish, but had not entirely cleared at the time of admission. During the period when the jaundice was most intense the stools were clay colored, but for the past two weeks they had again been light brown to normal in color. During this entire period there had been a rather constant dull ache in the lower abdomen, with two attacks of sharp upper abdominal pain which radiated backward to the angle of the left scapula. Throughout the period of illness there had been rather frequent mild headaches and he had been nauseated often, but vomited on only one occasion and thought that at this time the vomitus contained bile since it was extremely bitter in taste. At no time during the present illness had the patient felt really ill; he did not consult a physician until two days before entry to the hospital.

Eight years before admission he had one severe attack of upper abdominal pain lasting several hours. He had no jaundice at the time, but was told by his physician that he had probably had a gallstone attack. He had had the usual childhood diseases, including scarlet fever and an illness diagnosed as malaria. Typhoid was denied. Two years before entry he had difficulty of an undescribed nature in his right leg and was told that he had had an embolus.

The family history and marital history are non-contributory.

Physical examination showed a well developed, moderately obese man with deep jaundice of the skin, sclerae and mucous membranes. The pupils were equal and reacted to light and distance. The fundi were not examined. The teeth were false. The tongue and throat were negative. Lymph nodes were felt in both axillae. The chest was normal in shape, symmetrical, and showed equal expansion on both sides and no abnormalities on auscultation or percussion. The apex impulse of the heart was not

felt, but the lower border of dullness was within normal limits. The action was regular and the sounds were of good quality, no murmurs or thrills. The aortic second sound was equal to the pulmonic second. The pulses were equal and synchronous, of normal volume and tension. The radial arteries were palpable, the temporals and brachials tortuous. The blood pressure was 140/75. The abdomen was entirely negative to palpation. The liver edge could not be felt. Rectal examination was not done. The reflexes were normal.

Laboratory examination of three urine specimens showed gravities of 1.012-1.024. All contained the slightest possible trace of albumin and bile in moderate amounts. The sediment showed small numbers of red cells and rare hyaline and granular casts. Blood hemoglobin 75 per cent, red cell count 5,000,000, white cell count 9,000, polymorphonuclears 54, lymphocytes 33, mononuclears 10, basophiles 1. The red cells showed moderate achromia and slight variation in size, rare stippled cells. One stool was formed, brown in color, guaiac negative. A test for bile was slightly positive. The icteric index was over 100 on two occasions. The van den Bergh was 27 milligrams, whether direct or indirect reaction is not recorded. The Hinton test was negative.

The day after entry a barium enema showed no definite variation from normal in the colon. There was slight spasm of the rectosigmoid, but no definite diverticula were visualized. The appendix was well filled and not remarkable. There were no areas suggesting stones in the region of the gall bladder. Three days later a barium meal was noted to pass down the esophagus with slight delay at the cardia. The stomach was high and transverse. There was slight displacement of the antrum upward toward the diaphragm. There was definite delay in the passage of the barium into the duodenum. The patient had to be placed on his right side for twenty minutes before the barium could be forced through the duodenal loop. There was no evidence of intrinsic disease in the esophagus, stomach or duodenum. There did however appear to be a pressure defect involving the duodenum, but no definite mass was palpable.

Throughout the period of observation the patient was afebrile, the pulse 80-90, the respirations 20. Several donors were tested for compatibility and the patient was prepared for operation on the morning of the eighth day.

X-RAY INTERPRETATION

DR. WILLIAM C MARTIN. The film on the right shows the fundus of the stomach, which is not displaced with respect to the left diaphragm. The other film shows that the antrum of the stomach is displaced upward toward the diaphragm and is associated with an en-

larged duodenal loop. However, the medial edges of the duodenal loop do not show any evidence of a pressure defect in the region of the head of the pancreas. These findings are found in large patients with small livers, and are not considered of any importance with regard to the head of the pancreas. The only variation from the normal noted in the gastrointestinal examination was the marked delay in the passage of barium through the duodenal loop. The small liver and the slight increase in the soft tissue shadow in the region of the spleen are consistent with the x-ray findings in cirrhosis of the liver, but special films taken for the relief of the mucosa of the esophagus show no x-ray evidence of esophageal varices.

Conclusions The x-ray examination revealed no diagnostic findings either for carcinoma of the head of the pancreas or cirrhosis of the liver. The only positive variation from the normal that was found was the extreme delay in the passage of barium through the duodenal loop.

DIFFERENTIAL DIAGNOSIS

DR. WILLIAM D. SMITH When I read this case over I made a mental note that it was either ridiculously easy or a case that I could not diagnose at all. Probably we all think we know what the patient has. You have heard the history, all I can do is to run through it and make a few comments.

The patient is sixty-eight years old. He is in the cancer age, the gallstone age, perhaps a little old for mild hepatitis of such a type as catarrhal jaundice, but he might have it. He has had jaundice for a month, together with fatigue. The jaundice rapidly deepened in intensity and then began to diminish but had not entirely cleared up at the time of admission. The record suggests that it had diminished. If we know it had diminished it is hazardous to make a diagnosis of malignant obstruction. I hesitate to make a diagnosis of malignancy if I am sure that the jaundice has waxed and waned. On the other hand the patient's own observations are unreliable, and when we get to the physical examination we wonder if the jaundice has diminished much.

When the jaundice was most intense the stools were clay colored—obstruction of course,—but for the past two weeks they had been light brown to normal in color. If that is true it is against malignant obstruction. It would be interesting to know what the patient had been eating or what drugs he had been taking. I at one time deceived myself by giving a patient grape juice. He showed me a dark colored stool and he was so much encouraged that we had to give him grape juice until he died because we could not discourage him again.

During this period the patient under discussion had pain in the lower abdomen. I do not know why he should have had pain down there.

He had two attacks of pain in the upper abdomen radiating to the right scapula, typical of gall bladder or gallstone pain. It is worth remembering that a patient with cancer or malignancy in that region can also have pain that radiates into his back. It is not uncommon.

"Mild headaches" does not mean much.

The fact that he did not call a physician for his attacks of pain suggests that he did not have intense gallstone colic.

I did not understand that this illness diagnosed as malaria occurred in childhood. According to the wording of this history it might have occurred later. If so, there is nothing to say except that he may have had intermittent chills and fever or intermittent Charcot's episodes due to gall bladder or gallstone disease. I do not believe he had embolism. Of course visceral cancer may give thrombosis in the legs, but there is not much evidence that he had cancer of the stomach.

The physical findings are surprisingly negative. Lymph nodes were palpable in both axillae. We are not told how big they were. I think we can ignore them.

The abdomen was negative. I do not know whether we can assume that he had a small liver. It would be helpful if we could. We can assume that it was not very big. We might assume that he did not have a dilated gall bladder such as we should like to find if he had cancer at the head of the pancreas.

He was apparently intensely jaundiced, in spite of the fact that he said that he "had not quite cleared up when he came in." I should assume, because I want to assume it that the jaundice did not clear up. He perhaps saw himself in different lights and thought it had cleared up.

The urine is not important. There is some kidney irritation probably. There is a trifling degree of secondary anemia, again not significant. The normal white cell count and the low polymorphonuclear count might help us to believe he did not have an infectious process.

I think from the history alone, without knowing any more, we would be very suspicious of stone in the common duct. I think that as we read the physical examination and laboratory findings we feel less certain about it.

One thinks of various things, of the possibility of malignant lymphoma, of metastatic carcinoma with obstructive jaundice, caused by enlarged hilar glands. One thinks of a liver necrosis, but it seems to me that after a month he is not ill enough to have a really severe hepatitis in the way of marked liver necrosis or acute yellow atrophy. He has no hemorrhages, no petechiae, no stupor or other central nervous system symptoms. One might stretch a point and talk about chronic gall bladder disease and chronic pancreatitis, but I think those things most of us will dismiss. Cirrhosis does not seem to me probable.

The differential to my mind is most probably between stone or malignancy, perhaps cancer of the head of the pancreas. I do not believe the surgeons were quite sure, though they prepared him for operation. If they had been sure they might still have operated, because they might have considered the possibility of doing an anastomosis between the gall bladder and the duodenum or the small intestine. I think however on all the evidence one may say that he probably had malignancy, that he had a tumor in the region of the pancreas distorting the stomach and duodenum, and that on the law of chances it was very likely to be a tumor of the pancreas.

DR. TRACY B. MALLORY Dr. Means, have you any thought on this?

DR. J. H. MEANS I think I would put cancer of the head of the pancreas first. It would perhaps have been still more likely if they had felt the gall bladder.

I should like to comment upon one thing that Dr. Smith said. The waxing and waning of jaundice does not exclude cancer of the head of the pancreas. I had supposed at one time that it was strong evidence against it, but I can recall a young man who had jaundice which became complete, then entirely disappeared, then came back again. We thought he must have a stone. He did not. He had cancer of the head of the pancreas. That made quite an impression on me.

DR. SMITH I might have amplified that statement. I have known cases such as Dr. Means mentions, but they are so unusual that I will not make the diagnosis if the jaundice does wax and wane. You might have enlarged glands and an inflammatory condition on top that might increase the size of the glands with a good deal of obstruction, as you do sometimes in annular cancer of the intestine, but I have never been willing to make a diagnosis in the face of jaundice that clears up. I think I shall be right a great many more times than wrong.

DR. MALLORY Have you anything to add, Dr. Jones?

DR. CHESTER M. JONES I do not see how one can add anything. As a matter of fact the diagnosis does not interest me. I think it is more important to make a decision as to whether or not the patient should be operated upon. I think with the amount of pain he had he should be operated upon in the hope of finding stone in the common duct.

DR. MALLORY Would you like to say a word, Dr. Leland?

DR. GEORGE A. LELAND, JR. I agree with Dr. Jones. I think the important thing is a deci-

sion for or against operation, and let the diagnosis be made at that time.

FURTHER HISTORY

Under spinal anesthesia, which in the later stages of the operation was supplemented with gas-oxygen-ether, a right paramedian incision was made and the abdomen explored. No excess of fluid was found. There was no evidence of metastatic malignancy. The large intestine, the stomach and the small intestine were normal to palpation, as was also the body of the pancreas. The foramen of Winslow was patent. The gall bladder was greatly distended, to the size of a large pear, but was not adherent. No stones were palpable. The liver was rather small, abnormally firm, and suggested an early cirrhosis. In the region of the ampulla of Vater a small mass could be felt which appeared to lie within the wall of the intestine rather than in the head of the pancreas. It was thought at first to be a carcinoma of the ampulla of Vater. Transduodenal exploration did not permit of visualization of the tumor but enabled careful palpation, and it was now believed that the mass consisted of inflammatory infiltration or possibly non-malignant tumor. It appeared to be about three-eighths of an inch in diameter and three-quarters of an inch in length and seemed to extend upward along the common duct. It was felt that a cholecystoduodenostomy should give relief of symptoms and of jaundice, and this was done. During this period of the operation a finger was passed through the pylorus, which was found tight and spastic, but no anatomic lesion was present. It was therefore felt that the gastric retention was probably due to spasm and gastroenterostomy was not considered.

Following the operation the patient's temperature rapidly climbed to 104°, the pulse to 140, the respirations to 35. Two transfusions of 500 cubic centimeters of blood were given without appreciable benefit. He died thirty hours after operation.

CLINICAL DIAGNOSES

Carcinoma of the head of the pancreas
Obstructive jaundice
Postoperative hemorrhage

ANATOMIC DIAGNOSES

Subacute yellow atrophy of the liver
Jaundice
Chronic pancreatitis
Partial obstruction of the common bile duct.
Arteriosclerosis, coronary, splenic and renal, moderate
Prostatic hyperplasia, slight
Operative wound, cholecystoduodenostomy

PATHOLOGIC DISCUSSION

DR MALLORY At autopsy we agreed in part with the surgeon's findings, though not entirely. The liver was quite small and to our minds was soft rather than firm and the sections suggest a fairly recent atrophy which has gone on to the stage where it is fair enough to call it cirrhosis, but a process of not very long standing. The degree of fibrosis is not particularly great and the scar tissue between the hyperplastic nodules of liver tissue is still vascular and soft.

The common bile duct showed an area of thickening which was soft in character. It seemed to be inflammatory. I personally did not feel that it was an important element in the case and I felt that most of the jaundice and of the symptoms came from the very marked degree of liver damage.

This group of cases I think is a very important one, because, as Dr Jones put it, the diagnosis did not perhaps make so much difference as the question whether or not the patient should be operated upon. An acute atrophy of recent duration with incipient cirrhosis is almost invariably a very bad surgical risk and operation does harm, such little chance as the patient has lies in letting him alone. I can see no lead as to how one is going to recognize cases of this sort at the present time.

Have you any further comment, Dr Smith?

DR SMITH No, I think that is what one might expect, that the diagnosis seemed altogether too easy. It is a little hard for me to see why the patient was not sicker. If he had that amount of acute yellow atrophy and liver necrosis I should certainly expect him to be sicker.

DR JONES I agree with what Dr Mallory said about operation very rapidly tipping the scales in the wrong direction.

DR SMITH He had been jaundiced a month.

DR JONES That is not uncommon. I am sure there are cases of subacute yellow atrophy that will go a month with very few symptoms, no vomiting, and then very suddenly go bad. I do not know what the criterion is to make one say that this patient is going bad tomorrow or a few days later.

DR MEANS Dr Mallory, do you feel that the jaundice was due to intrahepatic obstruction?

DR MALLORY Yes, I do.

DR MEANS Why did he have a big gall bladder, and what rôle did the mass in the pancreas play?

DR MALLORY There was nothing in the head of the pancreas but inflammatory thickening and a very slight thickening in the mucosa of the bile duct.

DR MEANS I thought the surgeon described a mass.

DR MALLORY I was unable to convince myself of one. In regard to the second question, the reappearance of bile in the stools is evidence that the patient did not have complete suppression of bile. Some was getting through and would probably reach the gall bladder. The latter may not have been functioning normally and may have allowed it to accumulate.

DR MEANS What kind of bile did he have?

DR MALLORY It was colored. There is no further note as to that.

A PHYSICIAN What displaced the stomach?

DR MALLORY I think the small liver.

I think that one thing that might give a key to some of these cases would be an accurate clinical measure of the size of the liver. It seems to me that as many mistakes in diagnosis occur from inability to estimate the size of the liver as from any other point that comes up in physical diagnosis. Again and again the liver is considered enlarged clinically and at autopsy it is found to be small but peculiar in shape or unusually low in position.

A PHYSICIAN How large was the spleen?

DR MALLORY It was normal in size.

DR BERNARD M JACOBSON Do you think direct laparoscopy would be indicated in a case like this? Do you think the liver was small enough to be noted with direct visualization of the cavity with an instrument?

DR MALLORY I do not think you get much of an estimate as to the size of the liver with one of those machines. You could see the nodules on the surface and recognize atrophy or cirrhosis, but I am not sure that you could differentiate the two.

DR JONES Certainly the one physical finding that was absent in this case was the fact that with a month's jaundice, practically complete most of the time he did not have a big liver. Usually one would expect it. The other point that is important is the condition of jaundice and pain simulating biliary colic and gall bladder disease. I do not know how you are going to say it is not due to gallstones, but it has to be borne in mind that it does go with biliary colic or carcinoma of the pancreas.

A PHYSICIAN How much is the liver enlarged ordinarily in complete obstruction of the common duct?

DR MALLORY It is apt to be increased fifty per cent, sometimes one hundred per cent in size.

Simple bile stasis will bring it down half way to the umbilicus.

CASE 20112

PRESENTATION OF CASE

A twenty-two year old American housewife entered with the complaint of abdominal pain of twenty-four hours' duration.

The morning before admission the patient awoke feeling somewhat weak, but with no other

symptoms About ten minutes after her noon-day meal she had sudden severe midepigastrie pain which radiated downward, chiefly to the left lower quadrant but also to the right lower quadrant. The pain was followed by vomiting. She vomited more than ten times during the remainder of that afternoon. During the night the pain was very severe and the vomiting continued. She had chilly sensations and had to apply blankets and hot water bottles to keep warm. She had no urinary symptoms other than frequency five or six times that afternoon and five times that night. There was no burning. There were no tarry or bloody stools. There was no jaundice. She had two normal bowel movements the day before admission and one the morning of admission. She had been examined two months before entry, told she had high blood pressure and put on a diet.

She had been married for a year and a half but had never had sexual intercourse because of congenital atresia of the vagina.

Physical examination showed a well developed, obese young woman. Her lips were white. There was cold sweat and goose flesh all over her skin. Her abdomen was distended and tympanic. The liver dullness was obliterated. There was no board-like rigidity anywhere, but there was mild rigidity of the recti. There was diffuse tenderness to palpation and generalized spasm all over the abdomen, most marked in the right lower quadrant. There was no flank dullness or fluid wave. Rectal examination revealed moderate tenderness high up in the vaults. On anterior palpation a somewhat tender lemon-sized mass was felt in the midline. This was believed to be a retroverted uterus.

The temperature was 101°, the pulse 110. The respirations were 30. The blood pressure was 95/80.

Examination of the urine showed a large trace of albumin and twelve red blood cells per field. The sediment was loaded with white blood cells. The blood showed a red cell count of 4,300,000, a hemoglobin of 70 per cent, a white cell count of 17,500 and 90 per cent polymorphonuclears.

X-ray examination showed a high diaphragm. The lung fields were clear. The heart shadow was not remarkable. There was no visible air below the diaphragm except in the stomach and bowel. There was a rather large collection of gas in the colon and what appeared to be the cecum in the right upper quadrant.

Operation was performed immediately after admission. Following this she was given a transfusion. A few days after operation the temperature rose to 106°, the pulse to 145, the respirations to 35. Her urine became loaded with albumin and was dark in color. She developed pitting edema of the ankles and face. The output of her urine diminished in amount. On the seventh day a note was made that she put out only five cubic centimeters of urine in twen-

ty-four hours. The non-protein nitrogen at the time was 61 milligrams. The following day her non-protein nitrogen was 76 milligrams, the chlorides 618, the carbon dioxide combining power 46.2 volumes per cent, and the serum protein 5 per cent. She continued to be almost completely anuric. The edema increased and she became irrational. A hematoma appeared on the right buttock extending down towards the perineum. On the thirteenth day her non-protein nitrogen was 185 and the serum protein 4.2 per cent. She died on the following day.

DIFFERENTIAL DIAGNOSIS

DR. FULLER ALBRIGHT I agree with the people who saw her in the Emergency Ward that she had an acute abdomen, and I am assuming that they did find something in it.

DR. WILLIAM H. SNYDER JR. She had a gangrenous appendix. The operation was an appendectomy with drainage.

DR. ALBRIGHT That rules out any suggestion that she might have had acute pyelitis. It is rather unusual for a patient to come in twenty-four hours after the onset of symptoms with red cells, white cells and albumin in her urine unless she has pyelitis.

The question that seems most interesting to me is what happened to cause her death. Before taking that up I want to go back to a few things in her past history that are probably of no importance but perhaps require a little discussion.

In the first place one wonders whether there may not have been multiple congenital abnormalities. The congenital atresia of her vagina is perhaps of some interest, one would like to know if she had normal periods. One gets the suggestion that she had a normal sized uterus. Whether she was having any backing up of menstrual flow leading to endometriosis or chocolate cysts, passes through my mind.

Also we find that she did have hypertension in the past. This brings up the remote possibility of another congenital abnormality, coarctation of the aorta. I will return to that later.

It seems to me the next question is whether she did or did not have chronic nephritis. I think she did not, in spite of the one note about her having been told that she had hypertension. Against chronic nephritis are the following three facts: (1) She had a normal red cell count and hemoglobin. It would be helpful to know the specific gravity of the urine, but we are not told that. (2) The heart was normal by x-ray and physical examination, a fact which in any case is surprising because of the constant hypertension. (3) The fundi were presumably normal, as we are not told that they were abnormal.

The next question is, was this terminal event a uremia associated with dehydration from vomiting and a secondary kidney shut-down or some

acute kidney condition? I believe some acute kidney condition. If vomiting had caused this, her chlorides should have been low instead of normal because of loss of chlorides in the vomitus, her serum protein should have been high instead of low because of dehydration, edema should not have been present, her urine sediment should not have been so abnormal.

Therefore it comes down to the fact that she had some acute kidney episode. The question is what. The three possibilities which occur to me are septicemia with embolic phenomena in her kidney, acute hemorrhagic nephritis, and thrombosis of the renal arteries. The duration is against the first. The kidney damage could not get so far in so short a time. Also the emboli would almost have to come from endocarditis and I think that is unlikely.

The next possibility is acute hemorrhagic nephritis due to a septic focus with kidney shut-down in the acute stage, and that seems to me to be the best solution to the problem. I think we do not very often see patients die so quickly from acute nephritis, but I think that is the best probability.

The other possibility that occurred to me was acute infarct of both kidneys. There is the bare possibility that she had a coarctation, and that with the lowering of her blood pressure while she was in shock there was a thrombosis of the renal arteries, perhaps secondary to a thrombosis in the aorta. The possibility went through my mind that the acute abdominal condition might likewise have been a mesenteric thrombosis.

My guess, however, is that she had acute sepsis with acute hemorrhagic glomerular nephritis and complete kidney shut-down. There is just the possibility that there may have been thrombosis of the renal arteries. I do not know.

DR TRACY B MALLORY: Have you anything to add, Dr Faxon?

DR HENRY H FAXON: I can perhaps add a little to the story of the course which she ran. The house officers and several other men saw her, ten of us in all, and only two of us agreed as to the primary cause of her acute abdomen. She obviously presented a picture which is extremely rarely associated with an appendix. We felt that in her condition she ought not to be given general anesthesia if we could avoid it, and we did not want to give her spinal anesthesia because of her low blood pressure. I opened the abdomen under local anesthesia and satisfied myself that she had appendicitis without a very widespread peritonitis. The process was fairly well localized and walled off from the rest of the abdominal cavity. She was an obese girl, and to expedite matters and minimize trauma the local infiltration of novocain was supplemented by a short period of inhala-

tion anesthesia while the appendix was being freed up and removed.

Following operation she showed a marked elevation in temperature and was very sick, but on Ochsner regime she promptly proceeded to do very well. It has not been brought out that her temperature, pulse and respiration came down very satisfactorily during the period of the first week, and for a time it looked as if the case were going to have a favorable outcome. It was not until later that she showed the striking kidney signs that proved fatal in the end. So far as the abdomen went, it showed satisfactory progress. She drained a moderate amount and had no striking abdominal signs to blame, it seems to me, as a contributing factor in the fatal outcome.

DR MALLORY: Is there anything there to change your opinion, Dr Albright?

DR ALBRIGHT: No, I perhaps did not emphasize that there was sepsis elsewhere.

DR FAXON: As I remember it, the temperature not only came down but ran several days as essentially normal. Is that right, Dr Snyder?

DR SNYDER: It was very nearly normal.

DR GEORGE W HOLMES: Here is the chest film. I think we can all see that the heart is normal in size and shape. The question of coarctation has been raised. The only evidence of any particular value that we get by x-ray is a change in the lower borders of the ribs, and this is not always present. It is not in this case. Many of those cases, however, do show erosion of the lower borders of the ribs. If we have an opportunity of studying the case more carefully and films are taken in the oblique view, we can sometimes show the coarctation.

As to the question of free air in the abdomen, I think it would have been visible in this film. We should have seen the gas directly below the diaphragm. This film was probably taken in the upright position. It is important in taking these films with that point in mind to have the patient sitting up or on his side, so that the gas bubble will be visible.

The question has also been raised as to whether or not we are able to demonstrate the cecum without giving barium. I think we can. In this film there is a distinct shadow of the cecum, and then we can follow the course of the large bowel across the abdomen. Sometimes it is possible to outline the large bowel about as well by air as by barium. The cecum is apt to be high in cases with abscess in that region. In this case the cecum is hidden so that while we certainly cannot make a definite diagnosis of abscess we might suspect it with such an appearance.

This film was taken with the patient lying on her side, the rays were passing through from

front to back and no free air was demonstrated in the abdominal cavity. Occasionally with extensive adhesions in the abdomen the gas bubble is not formed.

This last film is a portable film taken four days after the first examination. The change in the size of the heart as compared with the first film is probably due to the way the film was taken and not to any marked increase in the size. I do not see any definite evidence of disease in the lung at that time.

DR EDWARD L. YOUNG, JR. Could you be sure of two kidneys in the second x-ray? The point being that in a person who shows some evidence of congenital abnormality we have to consider either a complete absence of one kidney or a hypoplasia.

DR HOLMES. There is a shadow here on the right that might be a kidney. I do not see anything on the left. Usually we can see the left kidney better than the right. With an abdomen as distended as this, one would not be justified in drawing any conclusion at all.

CLINICAL DIAGNOSES

Acute gangrenous appendix with local peritonitis
Essential hypertension
Vascular nephritis
Anuria.

ANATOMIC DIAGNOSES

Acute nephrosis
Operative wound, appendectomy
Localized peritonitis
Chronic fibrous pleuritis
Partial atresia of the vagina

PATHOLOGIC DISCUSSION

DR MALLORY. The autopsy findings here were quite peculiar. There was a small localized abscess in the appendix region well walled off by ileum. It had not spread to the general abdominal cavity. It did not seem large enough to be a very important factor in her death. Moreover it appeared to cause no intestinal obstruction.

The most interesting finding is the kidney. There were two of them and they weighed together nearly 550 grams, in other words twice the normal size. The capsules stripped very readily and left a somewhat pale surface. We thought that it probably was an acute glomeru-

lar nephritis, as Dr Albright predicted, but when we came to examine it microscopically the glomeruli were completely negative and there was a very severe grade of tubular damage. It is an acute tubular nephritis which would pass perfectly well for a bichloride kidney. Cooke* has recently described a similar type of nephritis in the alkalosis that follows pyloric stenosis with marked vomiting. The other condition in which a practically similar appearance is frequently seen is pregnancy, but an acute tubular lesion leading to a uremic death except in these three conditions is extremely rare. It is occasionally seen in diphtheria and a few of the exanthemata. I have never before seen it in sepsis, as it was here. The possibility of mercury was not thought of at the time of operation and no test was made for it, but I think it is quite improbable. Usually the entire gastrointestinal tract shows a marked inflammatory reaction, and that was not present here.

I will show you the sections. I think even at this power you can see long linear bluish masses, which are casts in the tubules. The tubular cells show a fairly extensive grade of degeneration and the glomeruli even with special stains are I should say absolutely negative.

DR CHESTER M. JONES. I had forgotten that I had seen her, but I wrote a note saying it was probably essential hypertension with renal damage and gastric tetany, because she did have the signs of tetany when I saw her.

DR MALLORY. The clinical picture comes very close to the picture seen in pregnancy, but the vagina, as was described, was very small, not wholly atretic, but certainly functionless. The uterus was infantile in type. The ovaries appeared to be normal.

DR AUBREY O. HAMPTON. We have had one or two cases of almost complete obstruction of both ureters by appendiceal abscess. I wonder if there is any indication at all of that condition existing here.

DR MALLORY. There is no suggestion of it here.

DR ALBRIGHT. Knowing the autopsy, it seems to me that acute mercurial poisoning best explains all the facts. This causes colitis,—why not inflammation of that appendage to the colon, the appendix? Otherwise we are left in a quandary as to why this patient should have developed acute appendicitis and acute nephritis at the same time. I wish I had thought of this. I could have worked up a good case with the vaginal atresia as the cause of the suicide.

*Cooke. A. M. Quart. J. of Med. 2: 538. 1933.

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A HEALTH CRISIS IN BOSTON

THE Health Department of the City of Boston faces a serious situation because of urgent demands for curtailment of its budget. Unwise recommendations of the Finance Commission*, not concurred in by its Chairman, have proposed emasculation of the Health Units and, very recently, at least equally unwise counsels have proposed that the supervising nurses of the Nursing Division be reduced to the position of Staff Nurses and that an equal number of Staff Nurses be discharged.

We are amazed that such proposals should be made in the name of economy. It is as if one should say "This tree is too large. Let us, therefore, cut off the fruit!" Would it not be better to improve the tree by wise pruning and by the removal of dead wood? Is it not possible that the Health Department, which for years has been growing in importance and in value to the public, might benefit now

Report of the Finance Commission of Boston to the Legislature December 31 1933

by a drastic reorganization which would conserve its vitality, increase its usefulness and at the same time make radical curtailments in the cost of operation?

The issue is sharply drawn. Responsibility for wise budgetary curtailment rests finally with the Mayor but, in this matter of health, he should have competent advice and be governed by it.

The Health Commissioner at this juncture is in a position to make a strong plea for continuance of the essential functions of the Health Units, against the threat to his Nursing Division, and to point the way to wise reduction of health expenditure.

The Mayor also has the opportunity, by wise curtailment in the Health Department, to perform a signal service to Boston which will be appreciated by all citizens who understand the value of good health service.

Under those circumstances would not the Health Commissioner do well to propose, and the Mayor to institute, a study of the problem by some well-recognized individual or group from elsewhere whose recommendations will be entirely free from local prejudice or personal considerations? We believe that such an investigation should be undertaken at once in the interest, particularly, of the poor of Boston, and above all for the benefit of their children whose life or death may depend on the quality of health service.

AN ATTACK ON THE VACCINATION LAW

ON March 6 1934 a concerted attack on the present law of this Commonwealth requiring the vaccination of public school pupils was made before the Committee on Public Health of the Legislature.

The hearing was on House Bill 896, which seeks to amend the present law relating to vaccination. William Shaw MacCullum was the attorney for the petitioners, and he based his argument on his avowed belief that the present law is unconstitutional in that it provides for the invasion of one's body over the objection of the individual. In his denunciation of the law and the practice of vaccination, this attorney worked himself up to an ecstasy of dramatic expostulation of his objection to the law and the underlying purpose of it.

In fairness to the legal profession we assume that his attitude was based on his expectation of winning the approval of his employing committee rather than on his lack of knowledge of the importance of vaccination.

If he is really unacquainted with the evidence in favor of the almost perfect elimination of smallpox through vaccination and the almost infinitesimal danger of this simple procedure, one might question the amount of study which he has devoted to this subject. His behavior

did not impress many in the audience with his forensic ability

Many of the arguments presented at this hearing were repetitions of the prejudices and fears which have been in evidence on previous occasions, one of which, relating to the dissemination of syphilis by cowpox vaccine, was stressed. A significant feature of the campaign conducted by the anti-vaccinationists, that of letters to members of the Legislature implying antagonistic activities in the future elections, was brought out by the committee.

As on many previous occasions, this effort to break down the present vaccination law requires prompt action by the medical profession in showing to the Legislature the almost unanimous feeling among public health authorities and physicians respecting the importance of preventing smallpox. Dr Robey, President of the Massachusetts Medical Society, Dr Rosenau, Professor of Preventive Medicine and Hygiene, Dr Chadwick, Massachusetts Commissioner of Public Health, and Dr T J O'Brien, Executive Assistant to Dr Robey, presented the important arguments in favor of vaccination, and showed the fallacies of the antis.

Unless the work of these representative men is followed up by practitioners, there is danger of Massachusetts losing the standing which has been acquired through the laws now in force.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

GARLAND, JOSEPH A B, M D Harvard University Medical School 1919 Physician to Children's Medical Service, Massachusetts General Hospital Consulting Pediatrician, Massachusetts Eye and Ear Infirmary Instructor in Pediatrics, Harvard Medical School Consulting Pediatrician to New England Baptist Hospital and Addison Gilbert Hospital, Gloucester His subject is "Dental Health A Problem in Nutrition" Page 563 Address 264 Beacon Street, Boston, Massachusetts

CLIFFORD, STEWART H M D Harvard University Medical School 1925 Instructor in Pediatrics and Child Hygiene, Harvard Medical School Visiting Pediatricist, Boston Lying-In Hospital Assistant Physician to the Children's Hospital, Boston, Massachusetts His subject is "A Consideration of the Obstetrical Management of Premature Labor" Page 570 Address 270 Commonwealth Avenue, Boston, Massachusetts

HIMES, NORMAN E B S, M A, Ph D Formerly, Fellow Social Science Research Council, Assistant Editor, Sociology Section, Social Science Abstracts At present, Assistant Professor of Sociology, Colgate University, Hamilton,

New York His subject is "The Medical History of Contraception" Page 576 Address Colgate University, Hamilton, N Y

RONKA, ENSIO K F M D Boston University School of Medicine 1927 Assistant Visiting Surgeon, Massachusetts Memorial Hospitals Courtesy Staff, Quincy City Hospital and Milton Hospital Assistant in Anatomy and Surgery, Boston University School of Medicine His subject is "Infestation with Diphylobothrium Latum Fish Tapeworm" Page 582 Address 15 Bay State Rd, Boston, Massachusetts

HAGGARD, HOWARD W M D Yale University School of Medicine 1917 His subject is "The Function of the General Practitioner in Public Health Work" Page 584 Address Yale University, New Haven, Connecticut

AUSTIN, A. E A.B, A.M, M D Harvard University Medical School 1887 Physician Emeritus, Boston Dispensary, Professor Emeritus, Tufts College Medical School His subject is "Progress of Gastroenterology in 1933" Page 588 Address 270 Commonwealth Avenue Boston, Massachusetts

MISCELLANY

COURT DECISION RELATING TO PUBLIC HEALTH*

City ordinance, making vaccination a prerequisite to admission to a public school, upheld—(Mississippi Supreme Court *Hartman v May, et al*) An ordinance of the city of Biloxi made it unlawful for any child of educable age to attend any school in the city to which the public generally was admitted unless the child, previous to the date of his or her application for admission, had presented to the superintendent, principal or teacher in charge of such school a certificate from the city health officer or some other reputable physician of the city showing that the child had been successfully vaccinated against smallpox or was immune to the danger of contracting the disease. A resolution on the subject, adopted by the board of trustees of the city schools was in accord with the requirements of the ordinance. The governing authorities of municipalities were empowered by section 2396 of the Code of 1930 'to make regulations to secure the general health of the municipality,' and by section 2417 "to make regulations to prevent the introduction and spread of contagious or infectious diseases" and 'to make quarantine laws for that purpose.'

An injunction was sought to restrain the defendants, the superintendent and board of trustees of the city schools, from refusing to permit the appellant, an 8 year old child, to enter school. The bill of complaint alleged that the child was excluded from school

*This abstract was prepared from a mimeographed copy of the decision furnished to the Public Health Service by the Mississippi State Board of Health

because he had not been vaccinated, that there was no epidemic of smallpox in the city, that the said child had not been exposed to smallpox or other communicable disease, and that he had violated none of the valid school rules. A demurrer to the bill of complaint was sustained by the lower court, and an appeal was taken to the supreme court.

On appeal it was contended that, in the absence of an express statutory requirement of vaccination against smallpox as a prerequisite to a child's right to enter the public schools, a municipality had no power to require vaccination as a condition precedent to the right to attend its schools, or, in other words, that the general statutory grant of authority to municipalities to make regulations to prevent the introduction and spread of contagious or infectious diseases did not empower municipal authorities to exclude children from the public schools because of failure or refusal to be vaccinated. The further contention was made that, in the absence of an epidemic of smallpox in the city the vaccination ordinance was arbitrary and unreasonable and, therefore void. After detailing the statutory provisions quoted above the supreme court went on to say

* * * The medical profession generally recognize vaccination as an effective means of prevention of the disease (smallpox), and we do not think that the ordinance requiring children to be vaccinated as a condition to their admission to a public school is an arbitrary and unreasonable exercise of the power to make regulations to prevent the introduction and spread of contagious or infectious diseases. The power granted is not only to make regulations to prevent the spread of such diseases but to prevent the 'introduction' thereof. The argument of counsel that the unreasonableness and invalidity of the ordinance is emphasized by the fact that there was no case of smallpox in the municipality or surrounding territory and no threatened outbreak of the disease is not supported by the averments of the bill of complaint. The bill merely charged that there was at the time no epidemic of smallpox in the said city.

In the exercise of the power and authority granted to make regulations to secure the general health and prevent the introduction and spread of contagious or infectious diseases much must be left to the judgment and discretion of the municipal authorities and the presumption is in favor of the reasonableness and propriety of regulations enacted in pursuance of such grant of power. The ordinance here in question was intended and reasonably calculated to prevent the introduction or spread of contagion and bears a direct and intimate relation to the maintenance of the health of the inhabitants of the municipality and we are unable to say that in the enactment thereof there was an unreasonable or arbitrary exercise of power. * * *

While there is authority in other jurisdictions for the view that a general legislative delegation of power to make regulations for the preservation of the public health does not confer on municipal or

school authorities the power to require children to be vaccinated as a condition to their admission to a public school, there is also ample authority supporting the views herein expressed. * * *

The appellant also contended that, in view of a constitutional provision requiring the legislature to establish "a uniform system of free public schools by taxation or otherwise for all children between the ages of 5 and 21 years" and of a statutory provision making school attendance compulsory, the municipal and school authorities of the city had no power to refuse him admission to school because of his refusal or failure to submit to vaccination. Concerning this the court said

* * * The same contention and argument was presented in the case of *McLeod v State, supra*, and while the validity of health regulations was not there presented the principle involved was the same and the language of the court in disposing of the point is applicable and controlling here. In that case it was held that Section 201 of the constitution does not deprive the legislature of the power to pass laws authorizing trustees of public schools to make reasonable rules and regulations for the government and conduct of such schools. In passing upon the apparent conflict between regulations excluding certain classes of minors from the public schools and the compulsory education provisions of the school code the court there held that the compulsory education provision of the school code and other provisions of the code authorizing reasonable regulations for the management, conduct, and control of schools should be construed together the court saying 'So construed, they do not mean that a child is entitled to attend a public school regardless of his conduct, but on the contrary that it is subject to such reasonable rules for the government of the school as the trustees thereof may see fit to adopt.'

The court concluded its opinion as follows

* * * It having been determined in the case at bar that the ordinance requiring vaccination as a condition to admission to the public schools was a reasonable and valid exercise of the power granted to the municipality to make regulations to prevent the introduction and spread of contagious or infectious diseases it follows that the appellant was not entitled to admission to the schools in violation of the provisions of the ordinance.

CLINICAL MEDICINE AND SURGERY CHANGES HANDS

Forty years ago *Clinical Medicine and Surgery* was founded by the Abbott Laboratories under the name of *The Alkaloidal Clinic* and with various changes of name and editorship has been owned by them ever since.

For the past ten years under the editorship of Dr George B Lake its editorial policy has been entirely independent but now with the passing of its sole ownership to Dr Lake it becomes fully independent, in form and in fact as well as in policy.

Assurance is given that there will be no recession from the editorial and advertising standards which have been maintained for many years, and no immediate change in its name or format, but it is felt that the new set up will allow an even greater freedom for coöperation and helpfulness, for readers and advertisers, than ever before.

The new editorial and business offices of "C M and S" will be in the Medical and Dental Arts Building Waukegan Ill, with a Chicago office at Room 670, 410 North Michigan Avenue

A LOW RECORD FOR DIPHTHERIA

Dr Henry D Chadwick, Massachusetts Commissioner of Public Health, has reported that during February 1934, diphtheria was less prevalent than at any time since records of this disease have been compiled. The figures are 27 cases in Massachusetts in February this year, as compared with 242 cases, the average February number for the previous five years.

This condition is a tribute to the State Health Department for efforts are constantly being made to secure the coöperation of local boards of health and physicians throughout the State. The education of the people is bringing more of the laity to accept the advice of doctors to have children immunized.

THE APPOINTMENT OF DR F C IRVING

Dr Frederick Carpenter Irving, Professor of Obstetrics at the Harvard Medical School since 1931, has been elected to the chair of the William Lambert Richardson Professor of Obstetrics, as endowed in the will of Dr Richardson.

Dr Irving graduated in medicine from the Harvard Medical School in 1906, and is Chief of Staff of the Boston Lying In Hospital.

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

THE CAUSE AND TREATMENT OF CROSSED EYES*

BY PAUL A. CHANDLER, M.D.

The terms crossed eyes strabismus or squint, refer to that condition in which one of the eyes is out of line with its fellow. It may be turned in or out or up or down. It is not at all an uncommon condition, probably occurring about once in every fifty to sixty children who consult an eye physician.

In at least fifty per cent of the cases there is a history of crossed eyes somewhere in the family, and not infrequently more than one child in a family is affected. I shall try to point out the more important causes, discuss various forms of treatment, and the results to be expected from such treatment.

The most important cause is lack of binocular vision, or ability to use the two eyes simultaneously. Most people have some minor muscle imbalance in their eyes, usually a latent tendency for the eyes to turn in or out. This tendency never causes difficulty, because with both eyes open the muscle difficulty is overcome, and the eyes are held parallel so that both eyes can be used together. If one of the eyes should turn out of line with the other, the result would be to see double. We therefore have a strong natural stimulus to overcome any minor muscle difficulty we may have in order to avoid double vision. Now, in most cases of crossed eyes there is no binocular vision. One eye only is used at a time, and thus double images are not seen, no matter how much one eye may turn. In these cases there is lacking, therefore the strong stimulus to overcome the latent muscle weakness and avoid double vision. The eye may turn very markedly, but cause the patient no inconvenience whatever. If then, there is no binocular vision, a muscle imbalance will usually cause one of the eyes to turn.

A second cause is a marked difference in the refraction of the eyes, as when one is farsighted and the other nearsighted. Here it is difficult under any conditions to use the two eyes together. The better eye will be used alone, and if there is a latent tendency toward a deviation, the poorer eye is apt to turn.

A third cause is a high degree of farsightedness. This creates a strong tendency toward convergence, and, if binocular vision is poor, a convergent squint is usually the result. These last two conditions do not always lead to crossed eyes, but often do especially where there is a poor muscle balance to begin with.

Parents frequently attribute crossed eyes to childhood illness or accident. True, the first sign of trouble is often noted after an illness or accident. The lowered general vitality may be just enough to bring out such a latent trouble, but these things will never cause the condition unless the underlying causes are present. One should not then properly say, for instance, that measles caused an eye to turn, but rather that measles unmasked a latent trouble.

Before leaving the causes of squint, let me say a few words about an entirely different type of squint from that which I have been discussing. I refer to so-called paralytic squint or squint due to a definite paralysis of one of the eye muscles. This occurs in a number of diseases affecting the nerve supply of the muscles. In most of these cases the crossed eye should be regarded as a symptom of some general disease, and usually rights itself when recovery from the disease takes place.

What is to be done about the condition once it is recognized? Well meaning friends will often advise parents to do nothing, saying that the child will probably outgrow it. This is very poor advice for the following reason where it is always

the same eye that turns this eye is never used, and almost invariably there is a serious loss of vision from disuse. Just how or why this comes about we do not know, but the fact remains that vision in a turning eye is often reduced to counting fingers a few feet away. If steps are taken early to force the use of the turning eye, this loss of vision can often be prevented. If it has already taken place it can often be partially or completely restored. The younger the child, the better the chances of restoring the vision. In infancy, vision can usually be improved very quickly. As the child becomes older this becomes more and more difficult. After the age of five or six there is not much hope of restoring vision that has been lost from disuse.

What parents should do, therefore, when a squint is first noticed is to consult a reputable eye physician. After a thorough examination of the eyes he will be able to evaluate the case and decide on the proper treatment. Treatment in general may be described as medical or surgical. Medical treatment consists in prescribing glasses and in various forms of exercises. Although the wearing of proper glasses alone will sometimes straighten crossed eyes this is by no means true of all cases. Probably not more than one-fourth of all cases are benefited by glasses, and in a good many cases glasses are never prescribed. There are a number of exercises which are tried in suitable cases, but here again in a good many instances, probably in most, exercises are worthless. The great difficulty with all of the exercises is that they must be done at an age when the child is seldom far enough advanced to do them properly. In general one can probably fairly say that few cases of crossed eyes are cured by the use of exercises.

In every case where it is always the same eye that turns, steps should be taken to force the use of the turning eye. This is accomplished by bandaging the good eye or using drops in it to blur the vision, and so oblige the child to use the poor eye.

There are many cases not helped by any of these measures and one must resort to surgical treatment. In regard to surgical treatment, the eye physician is often asked the following questions: Can crossed eyes always be straightened by operation? The answer is they almost invariably can. Is more than one operation necessary? It may be. If the eyes are not straight after one operation, a second may be done, or even a third, if necessary. Will straightening the eyes by operation improve the vision? It will not. Operation is purely for cosmetic purposes. Is there any risk to this sort of operation? One can answer this question by saying that of course there is some element of risk to any surgical procedure. In this case, however, the risk is so negligible that the eye physician unhesitatingly advises operation where it is indicated. What is the best time to operate? Whenever one is sure that medical treatment is ineffective. As a rule not before the age of five. Can eyes be

straightened after one has reached adult life? Yes, operation is just as feasible at age 50 as at age 5. Why operate at all if only for cosmetic purposes? Because crossed eyes may well constitute a serious handicap in the effect they may have on the emotional life of the child. Many children with this deformity become so shy and hypersensitive as to have their whole lives affected. They are the constant butt of their playfellows, and retire more and more into themselves to escape the ridicule of other children. Do not let your child grow up with this handicap.

To summarize, then, the principal causes of crossed eyes are as follows:

- 1 Lack of binocular vision plus a muscle imbalance
- 2 Marked difference between the two eyes plus a muscle imbalance
- 3 A high degree of farsightedness plus poor binocular vision. It is important to consult a physician early to avoid serious loss of vision in the turning eye. Treatment consists in wearing glasses, in exercises or in operation. Operation should be done in all cases where other forms of treatment are unsuccessful. I repeat no child should be allowed to grow up handicapped by the deformity of crossed eyes, nor should an adult with a squint think it too late to rectify such an unfortunate condition.

OBSTETRIC JABBERWOCKY

'Twas onset, and trimester third
The puerperium did bring
All round asepsis was the word,
And pelvic measuring

Beware maternal death rates, son,
The figures statisticians hatch,
Beware Caesareans, and shun
Pituitrin's despatch

He took his brushes in his hand,
Long time he scrubbed him, elbow high,
Then rested he by the parous she,
And wondered what to try

And as in spotless gown he stood
With fresh obstetric lore adame,
The thoughts of forceps seemed so good,
He promptly tried the same

One two! One two! And twins came through!
The sterile shears went snicker-snack!
He leaped the bed and felt each head,
And patted each plump back.

And hast thou thy delivery done?
Come, here's a job that's harder still
Thy task is now to figure how
Thou canst collect thy bill!

'Twas onset and trimester third
The puerperium did bring
All round asepsis was the word
And pelvic measuring

L. K. REED

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1933
AND SEVEN YEAR AVERAGE

MONTH ENDING MARCH 3, 1934

Diseases	1934				Average cases reported for week corresponding to Mar 3 for past seven years	1933			
	Week ending Feb 10	Week ending Feb 17	Week ending Feb 24	Week ending Mar 3		Week ending Feb 11	Week ending Feb 18	Week ending Feb 25	Week ending Mar 4
Cerebrospinal Men	—	—	—	—	2	2	—	1	1
Chicken Pox	130	116	72	90	105	100	96	94	105
Diphtheria	8	3	2	3	16	3	3	6	1
Dysentery Amebic	—	—	1	—	—	—	—	—	—
Dysentery Bacillary	—	—	—	—	—	1	4	4	—
Encephalitis Epid	—	—	—	—	—	1	—	—	—
German Measles	—	1	5	1	35	1	2	4	5
Influenza	18	3	6	24	36	87	38	24	24
Measles	33	39	30	49	276	148	159	189	178
Mumps	126	162	54	122	92	72	45	72	101
Pneumonia (Broncho)	36	31	31	29	47	49	32	38	48
Pneumonia (Lobar)	63	37	46	39	56	63	38	43	37
Scarlet Fever	58	50	44	53	90	98	97	137	109
Septic Sore Throat	1	—	—	—	4	3	—	—	—
Smallpox	—	—	—	—	1	2	1	—	2
Tetanus	—	—	—	—	—	1	—	—	—
Trachoma	—	—	—	1	—	—	1	—	—
Trichinosis	—	1	—	2	—	2	—	1	1
Tuberculosis (Pul)	20	24	11	41	26	18	26	13	29
Tuberculosis (O F)	—	—	4	4	3	2	1	—	1
Typhoid Fever	2	—	—	1	—	2	—	—	—
Undulant Fever	—	—	2	—	—	—	1	—	1
Whooping Cough	40	58	27	37	75	78	82	36	118
Gonorrhea	14	47	9	30	34	37	40	66	51
Syphilis	45	31	32	47	49	69	21	54	54

Remarks No cases of Asiatic cholera, glanders, plague, or yellow fever during the past seven years

CORRESPONDENCE

THE COMMON COLD AND INFLUENZA

City of New York
Department of Health
139 Centre Street
Borough of Manhattan

March 3, 1934

Managing Editor, *New England Journal of Medicine*,

I should like to comment on that part of your recent editorial on The Common Cold which deals with influenza

In New York City, cases of influenza have been reported to the Department of Health since 1918. Printed tables giving the reported cases week by week during this period are available. A study of these tables indicates that from time to time sharp rises occur in the number of reported cases. Almost

always the rise is abrupt, the peak being reached in from two to three weeks, the decline is equally sharp so that the entire flare-up occupies only from five to six weeks. When a sharp, sudden increase in the reported cases occurs, and when the course of the outbreak has the characteristics just described, I do not hesitate to say that we have been dealing with a specific infection one which we call "Influenza," and which is not an intensified form of the common cold. Other features of these sharp outbreaks also deserve consideration. Apparently, there is never more than one outbreak a year, and there are years when no typical outbreak occurs. The sharp outbreaks usually cause a marked increase in the general death rate, exacting a considerable toll of lives among those who have heart disease and among the aged. In seasonal occurrence these outbreaks do not agree with the seasonal incidence of influenza bacillus meningitis. Bacteriological examinations of fresh cases observed during

the course of these sharp outbreaks, i.e., cases reported as clinically "influenza" usually fail to implicate the Pfeiffer bacillus as a factor

Altogether the evidence is strong that during these sharp outbreaks we are dealing with a specific infectious disease, and not with a severe type of the common cold. To apply the term "influenza" only to infections caused by Pfeiffer's bacillus is illogical. Instead we ought to discard the designation "influenza bacillus" for the germ originally described by Pfeiffer.

In New York City, between the sharp outbreaks smaller numbers of cases are reported week by week throughout the year. In the absence of a specific diagnostic criterion, it is impossible to say whether these are really cases of the same infection which occurs during the five or six weeks of the outbreak. For the reasons presented above I believe we are in a position to make a correct diagnosis of the outbreak, after it has passed.

Very truly,

CHARLES BOLDUAN, M.D.,

Director of Health Education

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
March 3 1934

Managing Editor,

The New England Journal of Medicine,

In addition to the articles enumerated in our letter of January 30 the following have been accepted

Hoffmann La Roche, Inc

Tablets Digalen—Roche, 1 Cat Unit

National Drug Co

Scarlet Fever Streptococcus Toxin for the Dick Test (National) fifty test package

Typhoid Paratyphoid A Vaccine thirty 1 cc ampule-vials package

Parke, Davis & Co

Ortal Sodium

Capsules Oral Sodium, 3 grains (0.2 Gm.)

Sheffield Farms Co., Inc.

Sheffield B Acidophilus Milk

John Wyeth & Brother, Inc

Ampoule Solution Dextrose 25 Gm in 50 cc

Ampoule Solution Dextrose 50 Gm in 100 cc

Yours very truly,

PAUL NICHOLAS LEECH, Secretary

Council on Pharmacy and Chemistry

CONTRACT PRACTICE AND GROUP HOSPITALIZATION PLANS

March 2 1934

Editor, New England Journal of Medicine,

I am mailing a letter similar to this one, to my very good friend and correspondent Dr Olin West

of the American Medical Association, in order that its contents may be disseminated throughout the country. Incidentally, I was the first to point out to Dr West and his Bureau of Legal Medicine that the only proper way to meet the problem of contract practice was by injunction proceedings. This I did one year ago and the success of this method during the year has more than repaid me for writing the letter. There has not been one failure, but an accumulating row of successes.

Not one lawyer in a thousand is versed in medico-legal economics, hence the average legal opinion is not worth much in these matters. I have studiously avoided debate in the matter of group-hospitalization plans, preferring to wait until the affirmative and negative sides had exhausted themselves.

The moment seems opportune to point out that both sides have missed the essential nub of the issue. Here it is:

Any legal opinion to the contrary notwithstanding, no hospital which maintains a staff, which is not completely open to one hundred per cent of the medical profession, organized or unorganized, is a free agent in the matter of disbursing its services, or of entering into contractual relationship with the public as proposed in these various plans. No such contract could stand up in a court of equity for five minutes, and that is exactly the place for which these proponents are heading. *Verbum sapienti sufficit*.

Yours truly,

JOHN J. HURLEY, M.D.

RECENT DEATH

SWIFT—JOHN BAKER SWIFT, M.D. of 5 Circuit Road, Chestnut Hill, and with offices at 374 Marlborough Street, Boston, died at his home, March 9, 1934.

Dr Swift was born in 1883, the son of the late Dr John Baker Swift, who died in 1913, and Mrs Hettie Porter Swift.

His premedical education was acquired at Noble and Greenough's School and Harvard College. He graduated in medicine from the Harvard Medical School in 1908, and served an internship at the Boston Lying In Hospital. He had been visiting physician at the Boston Dispensary. He was a member of the Red Cross Unit which went to Halifax at the time of the explosion when many were killed and injured and had been an instructor to the Medical Officers training corps. He was a specialist in obstetrics and gynecology.

He is survived by his widow, Mrs Anna Greenleaf Swift, three daughters, the Misses Martha, Nancy and Jane Swift, and his mother now living in Paris.

Dr Swift was a Fellow of the Massachusetts Medical Society, the American Medical Association, and a member of several medical and social organizations.

NOTICES

A WARNING TO FELLOWS OF THE MASSACHUSETTS MEDICAL SOCIETY

A rule adopted by the Council of the Massachusetts Medical Society obliges the *New England Journal of Medicine* to drop from its mailing list all Fellows of the Society whose dues remain unpaid on and after March one of each year

The Treasurer of the Society has sent in the list of delinquent members, and the issue of March 22 will be sent only to those who have paid the annual dues

Please forward unpaid dues immediately in order to avoid complications

ANNOUNCEMENT

On Tuesday, March 20, 1934, the centenary of the birth of President Charles W Elliot will be commemorated at the Harvard Medical School Professor Walter B Cannon will deliver a memorial address, 'President Elliot's Relations to Medicine' The address will be given in the Amphitheatre of Building C, at 5 P M

RADIO HEALTH MESSAGES

MARCH, 1934

Sponsorship Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health

Courtesy WBZ Fridays, 4 30 P M

March

23 How to Keep the Well Child Well

30 Résumé of the Year's Work

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health Fridays, 4 40 P M

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI Fridays, 5 00 P M

Questions on Health and Prevention of Disease may be sent to Radio Health Forum State Department of Public Health, State House, Boston.

SPECIAL

Courtesy WEEI Fridays, 1 15 P M

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health, Blended with Classical Music

REPORTS AND NOTICES OF MEETINGS

PHYSICIANS' ART SOCIETY

On February 23, 1934, a group of physicians interested in art and artistic craftsmanship met at the

Boston Medical Library and organized the Physicians' Art Society of Boston.

A Constitution and By Laws were adopted and Dr J Dellinger Barney was elected President and James F Ballard Secretary Treasurer, to hold office until the first regular meeting of the society Dr Barney, in accordance with the By Laws, has appointed a committee on exhibits consisting of the following named physicians Drs L W Hill, Eli Romberg, S H Sturgis, G W Taylor and S C Wiggin, and Dr Barney and James F Ballard, ex officio This committee met on March 8, and voted to hold an exhibition of the work of members beginning April 23 and continuing through May 5 A smaller exhibition consisting of selections from that of April will be shown during the meeting of the American College of Surgeons which is to be held in Boston during October

Membership in the society is open to all physicians and dentists of Massachusetts and also to medical students and hospital internes All persons interested in the society are requested to send in their names and the names of other persons to James F Ballard at 8 The Fenway

Full particulars of the exhibitions with rules and regulations will be published at an early date

BOSTON CITY HOSPITAL HOUSE OFFICERS' ASSOCIATION

The Boston City Hospital House Officers' Association met on Monday, February 12, 1934, at 8 15 P M in the Cheever Amphitheatre of the Boston City Hospital, with Dr G T Mullen presiding

The first speaker was Dr Fuller Albright of the Massachusetts General Hospital, he discussed 'measuring sticks now available in diagnosis, study, and treatment of ovarian disorders' To study a matter scientifically it is necessary to measure it, at least roughly The ovarian hormones can be measured only by biological tests For the purpose of this study only estrin and prolactin A, the pituitary factor which stimulates the ovary to produce estrin, were considered

It has been difficult to establish normal standards for the production of estrin because it varies in a 28 day cycle, and because of the age variations Dr Albright used the 24 hour urine of two patients with rheumatic fever (otherwise normal women) injecting it into six castrated rats daily for a month, estrin was absent three days in one case, and one day in the other, indicating, he believes, that it is unlikely not to find estrin at any time in the normal 24 hour urine Using Zondek's method, the test for prolactin A was never positive in normal 24 hour urine

These tests are helpful in distinguishing hypopituitarism from hypo-ovarianism Thus in the former repeated tests were negative for both estrin and prolactin A, while in a case of hypo-ovarianism the estrin test was negative, and the prolactin A test strongly positive — this may represent a compensatory hyperactivity

The effectiveness of treatment of hypopituitarism with the active substance from the urine of pregnant women can be judged by the test for estrin if no estrin is produced after several weeks the treatment is not working. Likewise, if the prolan A test is positive it is illogical to treat with the above ovary stimulating hormone, giving estrin seems more logical.

Symptoms of the menopause are probably due to an excess of prolan A, for in all but one of a series of over 30 cases with hot flashes, the prolan A test was positive and the estrin test negative. In several cases followed for a number of months it was seen that the appearance and disappearance of hot flashes corresponded to the presence or absence of a positive prolan A test. Treatment with large amounts of estrin caused symptoms to disappear in some cases coincidental with the disappearance of the positive prolan A test.

Dr Robert C. Cochrane, chief of the second surgical service of the Boston City Hospital, spoke on the surgical treatment of thyroid disorders.

Of the non-toxic diffuse type the goiter of adolescence needs surgical treatment only if an adenoma develops in it. The simple or endemic goiter needs it only if pressure symptoms develop, or for cosmetic reasons. The non-toxic nodular type due to enlargement of fetal rests, commonly after the age of thirty should be removed because of the possibility of toxic or malignant changes.

For toxic diffuse goiter, i.e., Graves disease Dr Cochrane believes surgical treatment to be the quickest, safest, and most satisfactory. Iodine treatment should be used *only* as a preoperative preparation, since many individuals escape from its helpful effects, and its long use tends to make the gland more friable and operation thus more difficult. Iodine can well be used postoperatively to taper off toxic symptoms. The amount of thyroid to be removed can be learned only by experience, if a temporary myxedema should develop, thyroid can be fed but only under observation and with great care.

Dr Cochrane believes iodine should be given before operation to all toxic goiter patients, as it helps some and never does any harm. A discrete toxic adenoma may be simply enucleated but if it is associated with hyperplasia and eye signs a subtotal thyroidectomy should be performed. A subtotal resection should likewise be done for a toxic nodular goiter of the type which is diagnosed pathologically as colloid adenoma.

Subtotal goiter should be removed whether toxic or not. It may produce all sorts of symptoms even resembling angina pectoris.

Treatment of the thyroid condition should be carried out without regard for associated diabetes or other glycosuria since they usually improve after operation.

Malignancies which have broken through the capsule cannot be treated surgically except to resect the isthmus when it is pressing on the trachea.

Acute thyroiditis is best treated by wide drainage. Chronic thyroiditis, by hot and cold applications and the x-ray.

A non-toxic adenoma should be removed if it causes symptoms (other than those associated with a change in the basal metabolic rate), in one case such an operation caused the patient to feel much better, and was followed by the healing of a tibial fracture which had failed to unite for many months.

In heart disease, removal of a toxic goiter may make the patient a useful individual again. Removal of the thyroid, even when there is no pathology in it, has helped in some cases of congestive failure, although as yet the rationale is not known.

Dr Allan Winter Rowe, chief of the Evans Memorial Hospital discussed endocrine disorders, with special reference to studies he has made of cases of pituitary pathology. Pituitary disorders vary from the true acromegalic with active hyperpituitarism, (1) to the cases of congenital or early pituitary failure (2) two intermediate groups are also distinguished. Twelve skulls studied have shown changes corresponding to these groups: (1) large frontal sinuses, large jaw, diploic expansion, (2) similar, but sclerosis has begun under the designation of 'abortive acromegalic' (3) lack of hyperpneumatization, and sclerosis more pronounced, (4) hypopneumatization thin diploe. The picture of type (4) is found in Simmond's disease, and in midgets, who have a good mentality.

Measurements on the basal metabolic rate were made on a number of dwarfs and acromegalics. It was found that the oxygen used, and calories per hour, were proportional to the size of the individual tested. A congenital luetic dwarf did not fit into this series. The normal standards of six different workers based on age, sex, and weight, or weight-height, or surface area, were compared with these results and it was found that they were not strictly applicable. This may have been partly because dwarfs are children in size and sex and adults in age but it is felt that there is a definitely lowered basal metabolic rate associated with hypopituitarism.

Studies were made of the sitting height index in the same cases and compared with the values Drever found for normals. This ratio of weight to sitting height was found to be diminished in hyperpituitarism and increased in dwarfs of type 4. This value was also increased in several achondroplastic dwarfs but they showed no other evidences of pituitary involvement. Of a great many laboratory tests on them all were normal with the exception of a diminished galactose tolerance.

Dr Joseph C. Aub of the Huntington Memorial Hospital spoke on recent advances in knowledge of the hormones of the anterior pituitary. Tumors of the acidophile cells produce gigantism or acromegaly. Microscopic adenomata of the basophile cells are associated with increased blood pressure, obesity, very thin bones, absent menstruation, and some-

times diabetes Either of these groups, or the chromophobe cells may produce any picture by pressure on functional cells

The pituitary is intimately related to other glands of internal secretion. Its removal in rats causes atrophy of the thyroid, thin bones with blood calcium change (effect on parathyroid?), and thinning of the adrenal cortex, the stimulating effect of the pituitary on the ovary is well known. That the pituitary has somewhat of an antagonistic action to the interstitial cells of the pancreas is shown by the high sugar curve of acromegaly, the low sugar curve of hypopituitarism, and experiments on dogs. Removal of both pancreas and pituitary causes but a mild diabetes, but injection of pituitrin in such an animal makes the diabetes very severe. At least eight active principles have been isolated, by means of which the pituitary tends to link together all the glands of internal secretion.

It is being questioned whether the Froelich syndrome is due entirely to pituitary deficiency, or whether a lesion in the tuber cinereum just posterior to the gland is responsible for the obesity, as seems to be the case in rats. Another type of case is the Simmond's cachexia, which is similar but never associated with diabetes insipidus or obesity. A third type is the microscopic basophile adenoma of Cushing, of which increased blood pressure and red striae on the abdomen are signs

HARVARD MEDICAL SOCIETY

The bimonthly meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on February 13, 1934. Dr. John L. Morse presided. Two cases were first presented. The first patient was a six and one-half year old boy who had entered the Children's Hospital with the chief complaints of muscular rigidity and convulsive seizures during the four days before admission. A diagnosis of tetanus was made. Examination of the thoracic spine had shown a slight kyphosis and x-ray films showed fresh compression fractures of the fourth, fifth, sixth, and seventh dorsal vertebrae. The cause of these was believed to have been the muscle spasm of the disease. The patient was treated with antitetanic serum and quieted with amytal. Later he was placed on a Bradford frame for two and a half months and now he walks about in a plaster jacket. A number of cases similar to this have been reported in the European literature.

The second patient was an elderly man with chronic renal insufficiency. The patient's blood sodium and blood chloride had each dropped to below normal while the nonprotein nitrogen had remained constant, during a period of hospitalization and observation. This was made the subject of a brief paper by Dr. A. M. Butler on the mechanism of salt deficit in chronic nephritis. If the kidney functions by glomerular filtration and tubular reabsorption the renal insufficiency that causes retention of

substances of low serum concentration causes lowering of the concentration of substances of high serum concentration. The data presented showed that, if the urine volume was sufficient to provide for maximum nitrogen excretion, the ability of the kidney to reabsorb sodium and chloride was exceeded. The patient should of course be limited in his protein intake (the N.P.N. was high) but not limited in his salt intake. Determination of optimal fluid intake demands further study. In cases where there is a low serum protein, low nonprotein nitrogen, and concentrated urine a high protein diet is indicated and the salt intake should be limited in order to help avoid edema. In discussing the case Dr. Gamble emphasized the regulatory function of the kidney in addition to its excretory one.

The second paper of the evening was presented by Dr. L. D. Fothergill, on "The Specific Treatment of Influenzal Meningitis." The disease was first defined as that form of meningitis caused by the so-called bacillus influenza, which organism may or may not cause the typical epidemic influenza. The virulence of the organism and its antigenic composition and immunological properties have been the special problems studied. The importance of the disease is seen from the fact that this organism is the cause of about 20 per cent of the cases of non-tuberculous meningitis. The malady is one of young children and infants, 85 per cent of the cases occurring between the ages of two months and two and a half years. The bactericidal power of human blood has been found to follow a curve proportional to this in that this age group has the least bacterial resistance. The disease usually localizes in the meninges following an acute upper respiratory infection and bacteremia. Immunologically speaking, there are one or two serological groups, and all the meningitic strains of the Pfeiffer bacillus are virulent ("smooth" colonies, and having the "specific soluble substance") and this is of aid in the production of suitable serum from horses. Complement must be used with the serum given intraspinally for the medication to be effective. Seventy-five patients have been treated. Of these, nine have recovered, which apparently shows the value of the serum in this hitherto practically hopeless disease. Another group of patients received no benefit at all from the serum, and the third group showed some temporary improvement, with subsequent relapse. In the last group, at postmortem examination, localized, walled-off lesions have been usually found at the base of the brain. In response to questions at the end, Dr. Fothergill added that normal adult serum has not been shown to have a high enough immunity titer to be of any use. Standardization of the serum has not yet been perfected chiefly because it is difficult to establish the titer of a bactericidal serum and then again, animals are not very susceptible to the disease.

Dr. L. K. Diamond was the final speaker on the program, with the subject "Some Experiments in

Iron Metabolism It had been found at the Thorndike Laboratory at the Boston City Hospital in previous work that the presence in a collodion membrane of tertiary phosphates prevented the dialysis of iron and ammonium citrate. Hence it was wondered if the presence of iron interfered with phosphate absorption in the gastro-intestinal tracts of animals, or vice versa. It was proved that this was the case. When ferric chloride was added to a diet adequate to prevent rickets without the addition rickets was produced (rats). Other iron salts, including iron and ammonium citrate also produced rickets in rats in the same way. The presence of both iron and phosphorus in the gastro-intestinal tract at the same time thus inhibited mutual absorption. The addition of vitamin D to the diet hastened the absorption of phosphates and thus tended to prevent rickets even in the presence of iron. Dr Diamond believes that the ordinary iron intake is not sufficient to cause rickets in human beings by this action, but the possibility of it impairing phosphate intake, or of phosphates interfering with iron absorption must be always borne in mind. Anemic rats were not relieved of their condition by the addition of iron in small amounts to milk in their diet. Iron in excess and iron without milk were efficacious, however, in restoring the normal blood condition.

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The regular meeting of the New England Physical Therapy Society will be held in the Banquet Hall of the Hotel Victoria, 271 Dartmouth Street, Boston, at eight o'clock in the evening of March 21, 1934.

The program is in charge of Dr George B Rice.

PROGRAM

Subject: Nose and Throat Conditions
Topics:

1. The Faucial Tonsil — Anatomy, Physiology, Pathology and Various Methods of Removal (Illustrated.)
2. Hyperesthetic Rhinitis and Its Successful Treatment with Diathermy. George B Rice, M.D., Boston.

Discussion will be opened by Leighton F Johnson, M.D., Boston, Wilnot L Marden, M.D., Lynn.

Dr Rice will show some very interesting reflectoscope illustrations of diseased tonsils seen in his own practice.

Council Meeting at six, Round Table Dinner at six thirty.

All members of the medical profession are cordially invited to attend and to participate in the discussion.

ARTHUR H. RING, M.D., *Secretary*

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held in the Evans Auditorium of the Massachusetts Memorial Hospitals, Monday, March 26, at 8 15 P.M.

All members of the New England Heart Association and interested physicians are invited to attend.

PAUL W. EMERSON, M.D., *Secretary*

BOSTON MEDICAL HISTORY CLUB

Sprague Hall 5 The Fenway
Monday, March 19, at 8 15 P.M.

"Jacob Zahalon — Rabbi Physician" Harry A Savitz M.D.

"The Solomon M Hyams Collection of Hebrew Medical Literature" James F Ballard

Exhibition of books and manuscripts

JAMES F BALLARD *Secretary*

THE MALDEN MEDICAL SOCIETY

The next meeting will be held on March 20, 1934, at Malden Electric Co Hall, at 8 30 P.M.

Speaker Charles F Painter, M.D., Librarian, Boston Medical Library.

Subject "Some Interesting Facts in Medical History"

A. H. WARREN M.D., *Secretary*

NEW ENGLAND PEDIATRIC SOCIETY

The next meeting of the New England Pediatric Society will be held in Boston, Friday, March 23, 1934.

4 15 P.M.—Clinical Program. Children's Hospital, Longwood Avenue, Boston.

6 45 P.M.—Dinner. Vanderbilt Hall, Harvard Medical School.

EVENING PROGRAM

Boston Medical Library—8 15 P.M.

1. Present Knowledge of the Food Substances—Dr James L Gamble.
2. Factors Influencing the Viability of Premature Infants—Dr Stewart Clifford.
3. Discussion of Dr Clifford's paper by:
 - a. Dr Frederick C Irving
 - b. Dr Kenneth Blackfan
 - c. Dr Warren Sisson
 - d. Dr Richard S Eustis
4. Refreshments

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

March 16—New England Roentgen Ray Society will meet at the Boston Art Club, Boston, at 8 P.M. (Round Table Conference). Dinner at 6 30 P.M. for \$1.00 a plate.

March 16—Cutter Lecture on Preventive Medicine, to be given by Karl Landstener at the Harvard Medical School, Amphitheatre Building E, 5 P.M.

March 19—Boston Medical History Club. See notice above.

March 20—Centenary of the birth of President Charles W. Elliot. See page 608.

March 20—The Malden Medical Society. See notice above.

March 20—South End Medical Club will meet at the office of the Boston Tuberculosis Association 554 Columbus Avenue, Boston, at 12 noon.

March 21—New England Physical Therapy Society. See notice elsewhere on this page.

March 23—New England Pediatric Society. See notice above.

March 26—New England Heart Association See page 611

April 13, 20 and 27—Salmon Memorial Lectures See page 443 issue of February 22

April 16—Boston University School of Medicine to Conduct a Clinical Meeting at Boston City Hospital

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E R. Loveland, Executive Secretary, 133-135 South 38th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C Guy Lane 416 Marlboro Street, Boston, for details

July 24 31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H R. Schnitz General Secretary Dr H. E. Walther, Gloriastrasse 14 Zurich

September 3 6—American Public Health Association, at Pasadena, California. Dr J D Dunshie, Chairman, Local Committee on Arrangements

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York, N Y

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday, April 4—Essex Sanatorium, Middleton Clinic 5 P.M. Dinner 7 P.M. Speakers Dr Elliott P Joslin and Dr Howard F Root, Boston Subject Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting, at Salem Hospital, 8 30 P.M.

Tuesday, May 8—Annual Meeting Salem Country Club, Forrest Street, Peabody Dinner at 7 Speaker to be announced Subject to be announced.

RALPH E STONE, M.D., Secretary

221 Cabot Street, Beverly Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

The next meeting will be held on the second Tuesday of May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary

Sunderland Mass

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The next meeting will take place in May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D., Secretary

76 Church Street, Winchester Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T A. STAMAS, M.D., Secretary

226 Central Street, Lowell, Mass

NORFOLK DISTRICT MEDICAL SOCIETY

March 27—Faulkner Hospital, 8 30 P.M. Dr Henry H. Faxon and Dr Edward A. Edwards Symposium on "Varicose Veins Discussion by Dr E. E. O'Neil

April 17—Hotel Kenmore 8 30 P.M. Special Business Meeting

May—Annual Meeting Time place and program to be announced

FRANK S CRUICKSHANK, M.D., Secretary

1695 Beacon Street, Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

April 5—12 noon at Norfolk County Hospital. Speaker Dr Elliott P Joslin Subject Diabetes

May 3—12 noon at Norfolk County Hospital. Annual Meeting Election of Officers

N R. PILLSBURY M.D. Secretary

Norfolk County Hospital, South Braintree, Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program titles and speakers to be announced.

The Medical Profession is cordially invited to attend these meetings

JAMES H. MEANS M.D., Vice-President.
GEORGE P REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C MILLER, M.D., Secretary

27 Elm Street, Worcester, Mass

BOOK REVIEWS

The Renaissance of Medicine in Italy By ARTURO CASTIGLIONI Publications of the Institute of the History of Medicine, The Johns Hopkins University, Third Series, Volume I The Hideyo Noguchi Lectures Baltimore The Johns Hopkins Press, 1934 xiv + 91 pages Price, \$1.50

Dr Castiglioni, who is professor of the History of Medicine at the University of Padua where so much of Italian medical history was made in the past, has given a delightful and brief account of Italy and its medical worthies during the period of the Renaissance No one is better able to summarize the situation than the extraordinary author of this book As depicted in a most entertaining introduction by Professor Sigerist of Johns Hopkins University, we learn that Castiglioni, a graduate of the University of Vienna, has been head of the sanitary service of the Lloyd Navigation Company, with headquarters at Trieste, for a period of over thirty years While carrying on this routine medical work, he became interested in the history of medicine and, after the War, went to Vienna again, where he studied with Max Neuburger He soon became Neuburger's foremost pupil Returning to Trieste and his old position, which he still carries on in a most efficient manner, he was appointed professor of the History of Medicine at the University of Padua. Here he lectures occasionally to a roomful of eager students, for no one could be more popular in a university town than this eminent man He has also given courses in the history of Italian science at the University of Foreigners in Perugia His *History of Medicine* published in both Italian and French editions in 1931, is one of the outstanding contributions to the subject of our time A smaller book on *Italian Medicine*, in English, was published in New York, two years ago The work of Castiglioni illustrates in a way seldom seen in this country how a routine administrative post may be glorified by attaching to it an intellectual dimension such as the history of medicine

Alcohol Its Effects on Man By HAYEN EMERSON New York and London D Appleton Co, 1934 x + 114 pages Price, \$1.00

It is rather surprising to read in the preface of this book that all but two of the states (Arizona and Wyoming) have laws requiring the teaching of the effects of alcohol and other narcotics upon the

human system in all schools supported wholly or in part by public funds. Such courses are required for children after the third year of grammar school and before the second year of high school. This book has been written to provide school teachers and students, therefore, with the facts regarding the action and effects of alcohol on man as they are now known to the medical sciences. Dr. Emerson, who is professor of Public Health Practice in Columbia University and widely known as a teacher, extracted briefly from the large volume of literature on the subject all that is important in regard to the use of alcohol in its various forms. Without being critical of the moral issue, he has simply stated the facts in a manner which no one can question. He has left the ultimate decision to the reader, but, at the same time, has equipped him with an intelligent understanding of both the advantages and the dangers of alcohol. The book can be most highly recommended.

Addenda to a Bibliography of the Honourable Robert Boyle. By J. F. FULTON. Oxford Bibliographical Society Proceedings and Papers, Volume III Part 3, pp. 339-365. (1933)

The original bibliography of Robert Boyle was reviewed in the *New England Journal of Medicine* June 2, 1932. At that time it was pointed out that Boyle was a most difficult subject for bibliography as so many of his works were reprinted in various editions and issues that it was almost impossible to make a complete collection of his works. Professor Fulton suggested at the time of the publication of his book that additional notes might be needed and now these additions have come to hand published with the same care and thoughtfulness which made the bibliography such an important contribution to medical history.

Professor Fulton has done more to humanize bibliography in this country than anyone else and his work is not unlike that of Geoffrey Keynes, also a physician in England. Those interested in this subject should note Dr. Keynes' review of Professor Fulton's book in the *Bodleian Quarterly Record* Volume 7 No. 76, 1932, and particularly Fulton's paper on 'Haller and the Humanization of Bibliography' given as the annual oration of the Boston Medical Library and published in this *Journal* for February 18, 1932.

Pathogenic Microorganisms. By WILLIAM HALLOCK PARK and ANN WESSELS WILLIAMS. Published by Lea and Febiger, 1933. 867 Pages. Price \$7.00.

The tenth edition of this standard work by Park and Williams brings it well up-to-date. A large part of its popularity may be explained by the emphasis on useful laboratory methods. The vast experience of the authors enables them to speak authoritatively on all angles having importance from the public health standpoint.

The book is divided into three parts. The prin-

ciples of microbiology, including the general methods in use for obtaining, isolating and classifying microorganisms, together with a discussion of the various phases of immunity. The second part deals with a systematic description and classification of the bacteria, including the filtrable viruses and the pathogenic protozoa. Part three covers the applications of the various bacteriological procedures particularly in relationship to the examination of air, water, milk, shellfish and soil. A very useful section is the last chapter, that on practical disinfection and sterilization. The chapter on pneumococci is particularly helpful including a discussion of the newer types and the most satisfactory methods of typing.

This edition of this standard bacteriological textbook should continue the well merited popularity of the volume.

The Teaching of Preventive Medicine in Europe. University of London Health Clark Lectures 1932. By CARL PRATSCHT, M.D., etc., Professor of Hygiene in the University of Breslau. Oxford University Press, London. Humphrey Milford, 1933. 180 Pages.

Of these twelve lectures, the first surveys the field of preventive medicine and indicates the development in the present century of public health work as a function of the state in all enlightened countries. In the remaining lectures is described for each country of Europe the plan of organization under the Ministry of Public Health and the system of education for sanitary officers and public health workers. All who are interested in methods of health administration will do well to read this book in detail. To the more general reader it is impressive to note the rapid establishment everywhere of Institutes and Schools of Hygiene and the activity with which all Europe, including the League of Nations, is striving to extend the application of preventive medicine.

A Diabetic Manual. By ELLIOTT P. JOSLIN, M.D. Published by Lea and Febiger, Philadelphia. Fifth Edition, 1934. 220 Pages. Price \$2.00.

A request for a revision of this standard manual in 1933 indicates that the depression has not destroyed the demand for practical medical publications. The author has condensed a tremendous amount of useful instruction for patient and physician in a small volume and written into its pages sympathetic understanding of the human problems of the diabetic. In addition to dietary and insulin instruction sections are devoted to special topics such as the inheritance of diabetes, marriage of diabetics, surgical complications and diabetic children. New tables which formed a part of the prize-winning exhibit at the Milwaukee meeting of the American Medical Association in June 1933 emphasize methods to be employed in the future for the prevention of diabetes and its complications.

Physiological Health Edited by Jay B Nash Published by A. S. Barnes and Company 308 Pages Price \$2 00

This is the fourth volume of a series published by the school of education in New York University entitled "Interpretations of Physical Education"

It is a text for teachers of physical education in the schools. This little book is comprehensive in its scope and is, as is to be expected in a book in which chapters are written by different individuals, very uneven. The current theories, both psychological and physiological, are utilized to the utmost during the development of what should be the ideal child. These theories are sometimes stretched beyond their utmost, and at times are somewhat contradictory.

In general the book appears valuable for the purpose for which it is intended, but is of little or no value to physicians.

Studies from The Rockefeller Institute for Medical Research Reprints, Volume 86 Published by the Rockefeller Institute for Medical Research. 1933 621 Pages

Several articles of unusual interest to physicians are included in the varied range of subjects of this report. Of particular interest with regard to the understanding of allergic cutaneous manifestations is the article "Demonstration of Lymphatics in the Human Skin" by Hudack and McMaster. Claude and Murphy contributed an excellent review of transmissible tumors of the fowl. To those interested in arthritis, Vaubel's report on the synovial cells in tissue culture will be of much interest.

Neuroanatomy By J. H. GLOBUS Baltimore William Wood & Co., 1934 xv + 240 pages Price, \$3 50

This volume, now in its sixth edition, was first issued in 1915. It has had a well deserved success as a laboratory textbook and has found wide use in various medical schools in this country. The new edition has relatively few changes except in details. The material is still divided into two parts, one descriptive and the other instructions to the students as to how to make observations. The last half of the book consists of semi-complete illustrations, which may be removed by the student and completed at the time of his observation of the specimen. These plates can later be reinserted in the volume. By this ingenious device the book is greatly increased in value as a laboratory manual.

Curing Our Nerves By MARSHALL MORGAN CLOUD Pasadena News Syndicate, 1934. 206 Pages

This book, written in a semi-popular style is a rather personal account of the author's experiences in handling psychoneurotic patients. It is filled with many observations of a more general nature, not all

of which play any distinct part in the care of people with nervous disease. Although the text is of some value, the book is poorly printed and badly issued. The reviewer does not feel that it will serve any useful purpose, in view of the fact that there are many much better publications of this type available.

Annual Report 1932 The Rockefeller Foundation. Published by The Rockefeller Foundation. 402 Pages.

One of the most cheering features of this report is to read that in these dark days the assets of the Rockefeller Foundation total \$205,192,479.11

The five divisions of the Foundation report their work for 1932. The International Health Division reports on the control of yellow fever, malaria, hookworm, and the common cold, as well as other important diseases. During the year it spent nearly two and one-half million dollars aiding public health work in this country, twenty-two European countries and seven regions of the East.

The outstanding contribution of the division of Medical Sciences was the establishment and endowment of the Neurological Institute, headed by Wilder Penfield, at McGill University.

The divisions of Natural Sciences, Social Sciences and Humanities are not touched on in this brief review, the report of those divisions being of less immediate interest to the medical profession.

History of Urology Volumes I and II. Published by Williams & Wilkins Company, Baltimore Price, \$8 00 for both volumes. Prepared under the auspices of the American Urological Association.

The history of urology is written in two volumes. The first half of volume one is devoted to the history of urology in various medical centers throughout the country. It is interesting to note that "the American Urological Association was born of poor but honest parentage in a humble wine house in New York on Washington's birthday, February 12, 1902."

The last half of the first volume and volume two deal comprehensively with the genito-urinary diseases, their history, and American urologists' contributions to the understanding of these various diseases. It is extremely well done and is unique since it is the first attempt to record collectively the work of Americans in the field of urology. In this respect it is comparable to the French Encyclopedia of Urology.

At the end of each chapter a vast bibliography is appended dealing with the urologic condition discussed. These volumes should equally appeal to the gynecologist, pathologist, internist, and to all individuals interested in the history of American medicine.

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COOPERATION IN THE CARE OF THE PATIENT*

BY ELLIOTT P JOSLIN, M.D.†

FOREWORD My predecessors have presented so adequately so convincingly and so appealingly the privileges and duties of all physicians to the physical and humanitarian needs of the individual patient that common sense directs me to tread a somewhat different path and to point out how the care of the patient includes the care of his family and active cooperation of all their physicians, and I shall also attempt to describe what I like to think of as The Hospital Family and its place in our medical midst. I was strengthened in this decision by the words of President Conant in his keynote address at the 150th Anniversary of the founding of the Harvard Medical School when he interpreted present trends in medicine and indicated that discoveries in medicine in the future were far more likely to originate in groups of workers than to come from a single investigation. So, too, I believe that the time has arrived when the care of the patient is linked with the care of his entire family and, to secure satisfactory results all his medical attendants must unite in the task and thus they can do most advantageously in association with a hospital.

The Diabetic, his Family and his Doctor While exploring with you my thesis that the care of the patient includes that of his family and close contacts among his doctors, I shall draw freely upon diabetes as an illustrative disease. I am sure you will agree with me that it is appropriate to the occasion. And this is not simply because I think diabetes a good disease and because I think the diabetic somewhat of a superior being and that his outstanding physical and mental precocity should be cultivated, or for the reason that I have more experience with diabetes than I do with other diseases, but first, because diabetes is preeminently a disease of the latter half of life, that half upon which our medical efforts have made the least impression, secondly, because it is an hereditary disease and thus is lodged in and transmitted by the family in contrast to all save one of the major contagious diseases, thirdly, because it is a coming disease with so growing a frequency that the 1930 prophecy of Dr. Louis I. Dublin that

it would equal tuberculosis in importance in the space of 10 years is already more than approaching fulfillment and fourthly because diabetes is the disease *par excellence* which demands that doctor, surgeon, obstetrician, pediatrician, all the specialists and all our skillful laboratory friends work together as a unit both with the patient and his family to treat it. Fortunate it is that the diabetic more than repays us for all the pains we take with him because his very body has served as an enticing and productive laboratory for the elucidation of many problems of intermediary metabolism and presents an opportunity better than any other of which I know for the investigation of the premature advent of old age.

The Diabetic's Family Naunyn knew that diabetes was hereditary. He demonstrated heredity in 18 per cent of his patients. His whole theory of diabetes was based upon the hereditary background of the disease and he explained its early quiescence and its later appearance in adult life as a result of the play of accessory factors upon this inborn tendency. What a wise and thoughtful man was this Naunyn—the Nestor of Diabetes. Today's diabetic child proves that Naunyn's contention was true. Originally the diabetic child's heredity appeared to be a scant 20 per cent and was often reported to be less but that was due to his former brevity of life and to poor history taking. Naunyn really had the vision when he recognized the principle that in dealing with heredity it is "seek and ye shall find, knock and it shall be opened unto you." Today longevity replaces brevity of duration in the child and now at the end of only ten years since the discovery of insulin his first chance for a decade of a diabetic life, Priscilla White has proved his heredity to be 53 per cent, a figure also reached by Grote for 65 of his diabetic children. But there were some who rightly said that all the tenets of genetics were not fulfilled and therefore we went across the river to Cambridge to secure the advice of Professor Crozier of the Department of General Physiology in Harvard University and through him the direct assistance of Professor Gregory Pincus and thus resulted in the genetic proof that diabetes is hereditary in the Mendelian recessive sense. Not content with the original 500 diabetic families studied, Pincus and White confirmed their

*Lecture delivered at the Harvard Medical School November 16, 19, on The Care of the Patient.
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conclusions, first, by the addition of some 300 families (I stopped the series here remembering Professor Zinsser's warning of the futility of sitting on a boiled egg) and secondly, more fruitfully by the direct examination of 27 families of conjugal diabetics and various other family groups both diabetic and non-diabetic as well, the latter to serve as controls. In this task I cannot avoid the satisfaction of having interested the specialized knowledge of Harvard University in a clinical problem.

What are the applications of all this diabetic polyverbiage and diabetic heredity to the Care of the Patient? As a matter of fact the acceptance of the principle of diabetic heredity has changed our tactics in our warfare to defeat diabetes. At present we concentrate our efforts on the 400,000 patients in the United States with the disease, and the far smaller number of families which they represent, rather than dissipate our energies upon 125,000,000 citizens who do not have it and 98 per cent of whom we know never will have it. With more complacency and pity we can view the fat lady and fat man on the street, because, perhaps they have no diabetic heredity. On the other hand our zeal to educate the family of the diabetic is redoubled. In season and out of season we preach to the diabetic family the danger of two diabetics marrying one another and raising a 100 per cent brood of diabetics. It is only fair to say that we temper this pronouncement with the reassuring statement that if they do marry one another and do have 100 children, the last three of the hundred will not exhibit their diabetes until past the age of seventy, and the safer suggestion that if they would only be content to put up with non-diabetics for partners, at least their immediate children should be free from the disease. Not content with data thus far acquired upon the inheritance of diabetes, this last summer, Dr White with the courage of her convictions spent her Sunday afternoons hunting in diabetic families and actually found among 105 relatives of our patients eight wholly new and undiscovered cases. And what does this signify?

The unknown patient, the unknown diabetic, thus became recognized and so could receive in the incipency of his disease proper care. I think we do not half realize that the cases of a disease we don't see and therefore do not treat are the important cases. The carriers of typhoid bacilli, streptococci, tubercle bacilli and spirochaetae are the most dangerous enemies there are to those about them and, undetected, their respective diseases hurry these often innocent carriers to their death. These are the symptomless diabetic patients, often brought to light by insurance companies, and for whom I have incontrovertible evidence from my own records that their prognosis is better than that of the diabetic with symptoms, 42 per cent better in the younger decades of life, 38 per cent

better in the middle decades, and even in the oldest decades 31 per cent better.

How fascinating the hunt for the unknown diabetic in order to give him the attention he deserves! How can we recognize him? Must we depend upon sheer hard work alone, repeated and systematic examinations of the urines and bloods of all the members of all diabetic families? I trust not for long. Only the other day President Lowell warned against slavery to routine and contrasted it with imagination, "imagination. Ah, that is the essential, how to stimulate the imagination." We concede that diabetes is hereditary. Granted, but is there not some trait, some quality in the new born child which may give a hint as to whether he is liable, if he lives to his full three score years and ten, to develop the disease? Perhaps there is and in fact there may be several stigmata. Priscilla White found that diabetic children at the onset of their disease were 2.2 inches taller than the ordinary child, and because diabetic children are often precocious we are waiting for the physiologists and endocrinologists and all of you to describe a method by which an excess of the pituitary element can be recognized in any human being. Already we perceive the importance of the pituitary factor in the diabetic problem, because on the one hand diabetes is frequent in pituitary disease and on the other develops when the pituitary is active, at adolescence, during pregnancy, at the menopause, and the frequency at this latter period very likely accounts for the doubling of the incidence of diabetes in women as compared with men above the age of 45 years. Who has sought for a diabetogenic element at birth? When Professor Pincus asked so simple a question as to the frequency of the various blood groupings in diabetic families I could only plead ignorance. Do you know? We need some one across the Charles to ask us questions. What is the diabetogenic factor which is transmitted with the gene? How will you reveal it? If we only knew which children in a family were prone to diabetes we would be doubly solicitous for them.

Some of the predisposing causes to the outbreak of diabetes in a family can be foreseen and averted. Mr Meade of the Lincoln National Life Insurance Company long ago directed attention to the fact that if one eliminated the influence of obesity, the incidence of diabetes remained the same throughout life. It is quite unnecessary for the members in a diabetic's family to be or to become fat. My statistics show that fifty per cent of the women who develop the disease at the age of 45 years or above are 30 per cent overweight. The last 1226 diabetic female patients above the age of 45 years weighed 181 pounds. Certainly these are pretty fat ladies. Priesel and Wagner would dub them the blamable diabetics as opposed to the blameless type of diabetes in the child. But can we dismiss the subject so easily? Will not some

one couple the more reproachful words blamable doctors to the words blamable diabetics? For some time the doctor has not been excused if he simply treated his patient for smallpox, diphtheria and typhoid, but did not protect the family. I feel that the same responsibility exists for making an attempt to prevent diabetes in a diabetic's family or at least to make the attempt to diagnose it early in its course. We seek to uncover the beginnings of cancer and are trying hard to report tuberculosis years and months rather than days and hours before the patient dies, and we know that we shall never be successful unless we realize that the care of the patient includes the care of the family. To a far less degree than the plainly evident finger-pointing signs toward diabetes of heredity and obesity are the cautionary signals of hyperthyroidism, biliary disease and infections which to some extent favor the development of the diabetic predisposition. On the other hand liberal muscular development is antagonistic to it.

The Public Health Nurse I rather think the public health nurses have outdistanced us doctors in including the family in the care of the patient. A generation ago I confess there were so many patients to see in the "District" that scant attention was paid by me to the families. Originally the nurse simply nursed the patient, but times have changed and I suspect that a good share of the time of the modern nurse is taken up with the family of the patient. Sometimes certain of the medical profession think this has been overdone, but it may be that if these same doctors had a nurse in their home at the arrival of a new baby, they would not consider it amiss if the nurse found time to give a bath or two to the two and three year olds or confined to his room the first born just returning from school with a sore throat or sent still another with a pain in his stomach to bed, supperless, until the medical parent returned. Who would say that a nurse did her duty while caring for a patient, no matter what the type of his disease, if she did not report to the family doctor a possible case of tuberculosis in a brother or sister, wife or parent? Would she be excusable if she did not report suspected gonorrhea, syphilis or scarlet fever in the family of a woman approaching confinement? If a Public Health Nurse, must she not observe the circumstances of the family and bring together the doctor and the various welfare agencies for which she is a go-between? Criticism of the Public Health Nurse has been free, but even if deserved in one case, I believe praise due her for the remaining ninety-nine. We doctors, like these nurses, should feel resting upon us the care of the patient's family just as vividly as the care of the patient. We should train, direct and incite the nurse to exercise greater initiative in spreading knowledge of sound medical practices among our families and in reporting

to us the early symptoms of disease. It is up to us to prove that we, the doctors, rather than the nurses are the progressives in Community Medicine. Too often the Public is ahead of us both. Witness Pondville and other agencies for the care and diagnosis of the patient with cancer.

In our casual conversations with patients we should always impart the most modern medical ideas. In this way the patient is reassured, because he perceives that his doctor is alert, and we doctors are helped because we recite and thus make our own what we have just read. Likewise whenever the patient recounts what he has read of new medical lore, we should receive it eagerly, weigh it, and if we don't know about it, say we will find out the truth in the matter and report upon it, and then not forget to report. Always leave in the patient's mind a reputation for open-mindedness and a good memory and a willingness to do something more than was offered at the formal visit.

And in this discussion about the care of the patient and his family where would I be if I did not mention the activities of the Social Service Worker? I take it that her task is largely to become cognizant of the material problems confronting the patient and to adjust them to those of the family after she has delved into its resources. And here she does not stop because her training has widened her sphere of knowledge so that she is aware of the assistance which can be furnished by state, county, city, town, hospital or by a multitude of charitable agencies. You don't need to preach that the care of the patient includes that of the family to a Social Service Worker.

Cooperation Between Doctors With the passing of the doctor who did all kinds of medicine and surgery, the specialists have multiplied and I believe, contrary to the opinion of many, much to the advantage of the patient. The trouble about specialists has come about not because they know more than the rest of us, but because of lack of complete cooperation among all the medical attendants of the patient. Each of us physicians must be on our guard to work in the closest harmony with all the other doctors of the patient and his family. If we ourselves are ill, we want a specialist. With the woes of our beloved, we fly to the specialist instantly. Therefore, we cannot be too careful to recognize that our patients feel the same way and be ready to propose seeking special advice for those intrusted to our care. Cooperation cannot be one-sided. We simply all must work together and consider our patients with the eyes of the other doctor. Our success in this regard will surely show our own character and we might just as well take this to heart. Such medical interchanges are best fostered in hospitals where doctors doing all sorts of medical and surgical work are closely associated and learn to become

conclusions, first, by the addition of some 300 families (I stopped the series here remembering Professor Zinsser's warning of the futility of sitting on a boiled egg) and secondly, more fruitfully by the direct examination of 27 families of conjugal diabetics and various other family groups both diabetic and non-diabetic as well, the latter to serve as controls. In this task I cannot avoid the satisfaction of having interested the specialized knowledge of Harvard University in a clinical problem.

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enough that they should feel their duty done if they simply care for the diseased member, the family should take sufficient interest in the disease to join with the doctor and scientist in overcoming it. They should be so educated as to want an investigation after death so as to help the living. And don't forget that an operation during life is attended with pain and for the benefit of the individual, but an operation after death is painless and for the benefit of the family and mankind. I suppose that a large percentage of the funds given for the investigation of special diseases comes from families who have felt the effects of the disease.

May I develop the hospital family idea further? It includes the nurses. To them we doctors owe a great responsibility. Upon them our efforts for our patients depend for execution. If the nurse fails us, we acknowledge that the case is temporarily lost. I think we doctors owe them more and particularly more in the way of health. I realize we take better care of nurses than formerly, but I believe more should be done for them. We should include an x-ray of the chest in their yearly physical examinations. We should make it easy for these girls coming from all over the country to a strange city to secure aggressive attention for their teeth, their throats, their appendices and their feet and for their postures too. They are in the Hospital Family and it is only justice that everyone in the family should have good health, but should have extra good health. What group of people receiving intensive training have a lower expectancy of years of employment than do nurses?

Are not doctors themselves and doctors' families a part of the Hospital Family? I certainly think they are and that we should develop means by which they not only share in its expenses, but also in its benefits. If we begin at home and develop ways and means by which the not inconsiderable group of the medical fraternity in the community can receive protection against illness and direct aids to better health, it will open up avenues by which other groups may receive like benefits. No one will find fault if we doctors experiment with ourselves. If we can devise hospital insurance for the administrative, nursing and medical staff of a hospital and prove it to be practicable we will have accomplished a good deal for community medicine.

The non-professional employees are a part of my Hospital Family. Do we give them adequate medical attention? Do they really get as much as is offered by various industrial establishments? I doubt it. Through care in selection and promptness in treatment, the sanitarium for tuberculosis for employees of the Metropolitan Life Insurance Company in New York City is now only half-filled with tubercular patients. We hear of the high incidence of tuberculosis among nurses, medical students and young in-

ternes but who has investigated the hospital personnel? Are we not our brother's keeper? An assurance of an interest in their health should make a hospital position especially desirable.

Tuberculosis has been mentioned in our care of the patient and in our care of the Hospital Family but I would say a word further. In our detection of the disease we are lax, inefficient, and inexcusably late in diagnosis. Notably is this also true for diabetic patients among whom the disease is increasing. This increase among diabetics is explained because the patients live longer and thus are more exposed to tuberculosis, they participate more actively in life and are less sheltered in their homes. Tuberculosis is two to three times more common in diabetics than in non-diabetics, ten times as frequent in diabetic children. Of the cases recovering from diabetic coma, eight per cent develop it within three years and my colleague Dr. Howard F. Root to whom I am indebted for this information finds no incipient active case of tuberculosis in a diabetic reported in the literature and only rarely mentioned as having been seen. Even in our own group of 245 cases, despite our recent intensive search, there were but 4 per cent of incipient patients in contrast to the 96 per cent who were well advanced. Tuberculosis can be discovered early if we will use the x-ray method and it is high time that we appreciated this and took steps to employ it more freely. It is ridiculous that we have not profited more from this means, employed so extensively in studying children in the public schools.

Hitherto the expense of an x-ray has barred its usefulness. But I remember the time when a Wassermann test cost \$10.00 and rightly so, because few were done and the work was largely experimental. The cost of a blood sugar determination not long ago was \$5.00, even \$10.00 and also very likely rightly so although I feel sure any laboratory technician worth her salt would rather do twenty blood sugar tests at 50 cents apiece than two for five dollars each and indeed upon the former basis a hospital laboratory will profit. Wholesale tests are cheap while retail tests are costly. By the same reasoning I think we should purchase our x-rays wholesale, when dealing with large groups such as nurses, students, doctors, hospital patients, and particularly this should be done for diabetic patients. Doctors don't like to own that a machine is better than their senses but it is often true and we must concede that these outside aids in diagnosis are vastly better than we can ever hope to attain without them. Let us rejoice that there are such reactions as the Wassermann and the Widal and take advantage of these diagnostic sureties and go on to something else. You and I don't know how to perform these tests but I don't understand the intricate mechanism of my Ford car, but that car serves me every day and I only hope that my friends have

almost absolutely dependent on the special skill of one another. Therefore you can easily understand why I see in the Hospital Family the care of the patient and his family at its best.

The Hospital Family In the care of the patient and his family and in mutual contacts of helpfulness between his physicians I conceive of the Hospital Family as the unit. The hospital patients, of course, form the center of the unit, but in it are just as surely embraced those active in its multiform administrative capacities from the Superintendent to the veriest scrub woman on the stairs, the nursing staff, both graduate and undergraduate, the technicians and social workers, the various medical staffs, and two other groups which have not yet generally received proper recognition, namely the families of the patients and the doctors of those families. The interests of all these groups are intertwined and real progress can only be achieved when there is cooperation between all.

The education of the patient in regard to his disease is increasingly engaging the attention of us all. This education is a function of the Hospital Family. The custom began with tuberculosis. The consumptive patient is seldom cured and his disease is only in part arrested while he is in the hospital, but he learns how it can be arrested, and is taught how to protect his relations from tuberculosis. Then comes the education of the diabetic. He really is expected to study diabetes, to attend classes and to receive individual instruction. More and more are we seeing educational methods proposed and undertaken for patients with other diseases such as rheumatism, anemia and those of the gastrointestinal tract. Then there are other varieties of education which are so much a matter of course that one almost forgets to mention prenatal care and the care of the child. Everywhere today we see education in medicine and to a large degree this is education for the patient's family as much as for the patient and in general it radiates from a hospital because here it can be organized. In a doctor's waiting room there is education to be had, but it is not often enough made alluring.

The education of the patient in the hospital is sure to increase. There is less acute illness and more and more chronic illness. The patient is far more comfortable, and has far less pain. He has much leisure time and recognizes or should be made to recognize that hospital hours must not be wasted and that he should obtain medical knowledge for himself and his family although confined to bed. In all this education I believe the family should share. The patient is nearly always dependent upon the family and the relatives should be shown for the patient's sake what his treatment should be and how he can be protected, and also for their own sakes they should be taught the most modern

of medical ideas through which they can avoid what has befallen their relation. They are almost more vitally concerned than the patient, because they probably must bear the brunt of the cost of medical care. For a chronic disease this far exceeds the expenses incident to acute disease although it is to a large extent unappreciated. If the little toe of a diabetic is burned with a heater of most any description, the economic loss is almost five hundred dollars and that without compensation of physician or surgeon.

Education in cancer has been consistently pressed these last few years, but I cannot help feeling that excellent as has been the endeavor, it has in part been misdirected, because it has not sufficiently taken account of the willingness of the patient's family to be educated in cancer prophylaxis. Quite apart from the question of heredity I believe that the best results in the prevention and early detection of cancer should come from the education of the family in which there has been cancer. The family which has had a cancer member should be far more apt and alert to discover a new case than a family in which this disease has not occurred. If cancer in one member of a family was discovered late, that family will be all the more anxious to detect it early, should it appear again, and if treatment in a member was successful that family will see the advantage of prompt recognition. Relatives of cancer patients or better the patients themselves should be encouraged to speak of their recovery and to be proud that their family was bright enough to secure for them prompt treatment. I should like to see the average duration of time computed between the onset and recognition of cancer in families in which cancer has and has not been previously known to exist. Concentrate on the education of the relatives of cancer patients. Use these families to secure further cases at an earlier stage and exploit the reasons for the successful results.

Patients, particularly diabetics, should be taught the educational value and the duty of living lives which will be useful to those similarly afflicted. For years I have tried to impress children with the fact that every honest diabetic day that a diabetic child lives holds out hope to a patient more seriously diseased and have sought to cheer poor old decrepit but courageous diabetic souls, while recovering in an open ward from gangrene, that it was from such as they that came the first proof on a large scale that faithful and prolonged diabetic treatment pays. No diabetic patient can live unto himself alone. His influence, and he must be made to feel this, is never indifferent, but always for good or ill upon other patients.

Disease Consciousness has its advantages as well as its disadvantages. It is always well to face the truth and if disease is present in a family, the family should realize it. It is not

enough that they should feel their duty done if they simply care for the diseased member, the family should take sufficient interest in the disease to join with the doctor and scientist in overcoming it. They should be so educated as to want an investigation after death so as to help the living. And don't forget that an operation during life is attended with pain and for the benefit of the individual, but an operation after death is painless and for the benefit of the family and mankind. I suppose that a large percentage of the funds given for the investigation of special diseases comes from families who have felt the effects of the disease.

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The non-professional employees are a part of my Hospital Family. Do we give them adequate medical attention? Do they really get as much as is offered by various industrial establishments? I doubt it. Through care in selection and promptness in treatment, the sanitarium for tuberculosis for employees of the Metropolitan Life Insurance Company in New York City is now only half-filled with tubercular patients. We hear of the high incidence of tuberculosis among nurses, medical students and young in-

ternes, but who has investigated the hospital personnel? Are we not our brother's keeper? An assurance of an interest in their health should make a hospital position especially desirable.

Tuberculosis has been mentioned in our care of the patient and in our care of the Hospital Family, but I would say a word further. In our detection of the disease we are lax, inefficient, and inexcusably late in diagnosis. Notably is this also true for diabetic patients among whom the disease is increasing. This increase among diabetics is explained because the patients live longer and thus are more exposed to tuberculosis, they participate more actively in life and are less sheltered in their homes. Tuberculosis is two to three times more common in diabetics than in non-diabetics, ten times as frequent in diabetic children, of the cases recovering from diabetic coma eight per cent develop it within three years, and my colleague Dr. Howard F. Root, to whom I am indebted for this information, finds no incipient active case of tuberculosis in a diabetic reported in the literature and only rarely mentioned as having been seen. Even in our own group of 245 cases, despite our recent intensive search, there were but 4 per cent of incipient patients in contrast to the 96 per cent who were well advanced. Tuberculosis can be discovered early if we will use the x-ray method and it is high time that we appreciated this and took steps to employ it more freely. It is ridiculous that we have not profited more from this means, employed so extensively in studying children in the public schools.

Hitherto the expense of an x-ray has barred its usefulness. But I remember the time when a Wassermann test cost \$10.00 and rightly so, because few were done and the work was largely experimental. The cost of a blood sugar determination not long ago was \$5.00, even \$10.00 and also very likely rightly so, although I feel sure any laboratory technician worth her salt would rather do twenty blood sugar tests at 50 cents apiece than two for five dollars each, and indeed upon the former basis a hospital laboratory will profit. Wholesale tests are cheap while retail tests are costly. By the same reasoning I think we should purchase our x-rays wholesale, when dealing with large groups such as nurses, students, doctors, hospital patients, and particularly this should be done for diabetic patients. Doctors don't like to own that a machine is better than their senses, but it is often true and we must concede that these outside aids in diagnosis are vastly better than we can ever hope to attain without them. Let us rejoice that there are such reactions as the Wassermann and the Widal and take advantage of these diagnostic sureties and go on to something else. You and I don't know how to perform these tests, but I don't understand the intricate mechanism of my Ford car, but that car serves me every day and I only hope that my friends have

one as good. It is all right to teach auscultation and percussion, but if we really wish our students to diagnose tuberculosis early, we are not honest unless we tell them to get an x-ray picture.

The expense of taking an x-ray plate will not be prohibitive if we create a sufficient demand so that the films can be procured on a large scale. I am told by the Roentgen-Ray Department of a hospital in Massachusetts that an x-ray (11 x 14) film including the material used in developing it and the service of a technician, but not the overhead of space, heat, light, water and correspondence, is 79 cents, and that one technician can take and develop 34 such films daily. In another state a Roentgen-Ray Department advises me that if 1000 films were purchased, a fair charge would be two dollars apiece and in still another state the Tuberculosis Society purchases such at a local hospital at this price. I believe that it would be to the advantage of our x-ray friends to promote the use of the plain x-ray plate wholesale and to urge us doctors to secure these by hundreds and thousands instead of singly. Unquestionably if this were done it would lead to the discovery of many unknown cases of early tuberculosis. I know my x-ray friends will gladly take a plate for nothing, but no one can ask them to take as many plates as we ought to have.

Now that it has been forced upon me that my diabetics are two to three times as liable to tuberculosis as non-diabetics, that diabetic children are ten times as likely to have the disease as non-diabetic children and that eight per cent of our cases saved with such difficulty from diabetic coma will develop consumption within three years, I shall meet the challenge. I shall do my best to make possible so early a diagnosis of tuberculosis in diabetes as to reverse the picture and thus prove that this special group of 400,000 patients by reason of their being under constant supervision can escape this menace or at least have it discovered at an earlier stage than as if they were nondiabetic. Think of it! We have free examinations to detect the earlier stages of typhoid fever, of diphtheria, of syphilis, but when it comes to the detection of the earliest stages of the major communicable disease which afflicts Massachusetts, we are at sea or forced to beg for charity.

Routine x-rays of the teeth yearly for individuals above the age of fifty are most helpful. The expense of such x-rays is considerable. I believe that if an offer were made to the members of the entire Hospital Family to take such x-rays provided there was application for 500 or more a year, i.e., to allow quantity production, both the hospital and the members would benefit.

In all that is said about x-ray examinations I hope I am making it clear that I would increase the demand for x-ray examinations so

much even though the rates per unit were less than in the end those engaged in x-ray work would benefit.

The hospital diabetic family wants a vacation and today any hospital diabetic family which has not an opportunity to allow its members or at least the children to spend two to four weeks at a diabetic camp in the country is behind the times. If the state and the community supply preventoria for tuberculosis, why should they not make possible preventoria for diabetic children who, as I have said, are peculiarly susceptible to tuberculosis?

The hospital patient is usually a temporary patient, a patient lent to the institution and the staff. Loans require interest and repayment. This leads to consideration of the family doctor and his relation to the Hospital Family. Frankly the hospital patients are his children and should be regarded as such. The hospital may help them somewhat, it may educate them a good deal, but unless it reports the methods employed in their treatment, returns them to his care, it is not paying its debts. I know this holds true for diabetes and we certainly try to inculcate in the minds of patients to stick to their family doctors. The patient who develops coma is usually the one who has not visited his family doctor for a long time, the patient who has frequent insulin reactions usually has not reported the same to his physician and it is the uncontrolled, poorly treated diabetic child who is ten times more liable to cataracts and arterio-sclerosis than the controlled and carefully treated diabetic boy or girl.

Our present hospital contacts with the family doctor are unsatisfactory. The hospital should consider the family doctor of each patient it admits as an actual member of the Hospital Family. It should place at the disposal of that doctor ready access to its manifold facilities, its laboratories of chemistry and pathology, examinations by x-ray and the electrocardiogram and metabolism, and make these available for emergency tests on holidays, Sundays and even nights and in this manner should put the family doctor to a large degree on a par with the hospital doctor. The hospital should provide for the doctors, who lend it patients, nursing service from its tested graduates by the hour, day or week, including specialized nursing service such as that of the wandering diabetic nurse to assist him in his diabetic families. The hospital, and I know this is being done more and more, should cultivate the interest of the family doctor and secure his cooperation during the actual care of his patients while in wards or private rooms and then return them with such constructive advice that he can take advantage of it in the care of similar cases who wish to remain in their homes. By such measures the family physician should be made to feel that he is entitled to special privileges in the hospital which receives his patient and in fact that he,

too, is really a part of the Hospital Family. Then and then only will our patient and his family receive adequate care.

These are some of the ways in which the care of the patient will include the care of his family and the cooperation of all his doctors. It is one answer to the Costs of Medical Care. To me it furnishes the attractive answer because it provides for all sorts and conditions of men from the poorest to the richest and allows charity to be personal. I realize my Hospital Family does not reach all classes, but it does reach

a good many for whom large institutional hospitals do not and ought not to provide. By its very limitations it may succeed. Suppose there are 200 nurses in one hospital, 200 employees, 100 doctors, 500 affiliated doctors and the patients number 5000 annually. All together we have 6,000 individuals representing as many homes and thus reaching out to perhaps 30,000 lives, surely a sufficient number. I conceive of the ideal Hospital Family as touching them all and that if it does not do so, it is failing in its task.

THE TREATMENT OF ACUTE POLIOMYELITIS WITH THE RESPIRATOR*

BY NEIL LOUIS CRONE, M.D.†

THE Drinker respirator was used at the Massachusetts General Hospital throughout the epidemics of poliomyelitis of 1931 and 1932. A sufficient number of patients have been treated to make it worth while to assess the value of the respirator as a therapeutic agent.

In 1930 there were thirty-two cases of poliomyelitis treated in this hospital. Nine of these were treated in the Drinker respirator. In 1931 there were forty-seven cases, of which fourteen necessitated respirator care. One additional case was treated in 1932. This report, therefore, is based upon twenty-four cases.

There is already growing up a small body of literature which reports in a scientific manner on the use of the respirator, and one series of cases has been studied in detail by Wilson. He has pointed out that poliomyelitis may interfere with the respiratory function in three ways: (1) by paralysis of the intercostal muscles and the diaphragm, (2) by disturbance of the medullary "centres", and (3) in patients with pharyngeal paralysis, by the collection of mucus or vomitus, either obstructing the respiratory passages directly or leading to irritative spasms of the glottis. In addition we have seen respiration interfered with by the vocal cord obstruction in bilateral laryngeal paralysis.

These three groups overlap clinically. In our experience, also, the cases falling in Wilson's third group are largely of the bulbar type, so that for the purposes of this paper I shall consider our twenty-four cases in three slightly different groups: (1) those with respiratory difficulty due to paralysis of the muscles of respiration, (2) those with respiratory difficulty due to bulbar involvement, and (3) those in which both disturbances are active. Our methods of analyzing these cases and our conclusions are

very similar to those of Wilson, although we have not had such good therapeutic results as he.

In the first group, cases with paralysis of the intercostal muscles and diaphragm, the respirator is of greatest value. These cases are often, although not always, of the ascending type, so that by the time the respiratory muscles are involved there has also been extensive and considerable paralysis of the legs and arms. The use of the respirator is justified in these cases on the assumption that after the acute stage is over, the patient will recover sufficient respiratory muscle power to enable him to breathe outside the respirator. A secondary consideration, but an important one from the patient's and the family's point of view, is the hope that sufficient general muscle recovery will occur so that the patient will be able to fill a useful place in society.

Of the cases with paralysis of the muscles of respiration, we have had nine, five have died. The direct cause of death in four cases was cardiac failure and in the fifth hypostatic pneumonia. The last patient was in the respirator with complete paralysis of practically all the body musculature for a period of six months before death. One of those dying from cardiac failure had spent all, or part of, nearly every day for eighteen months in the respirator, she also had complete paralysis of both legs, both arms and the trunk. Roentgen examination disclosed bilateral hydro-ureters with marked dilatation of the renal pelvis, which were packed with stones. This complication, probably due to the action of gravity on the ureters as they passed over the pelvic brim, was found postmortem in one other case in this series.

Of the four patients in this group who are living, two have been followed for two years. Both present such paralysis of all four extremities and of the trunk muscles as to keep them bedridden. One is forced to return to a respirator with every upper respiratory infection. Two others of this group have been followed for one

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year One was in the respirator off and on for seven months and is now practically completely paralyzed and confined to bed The second, a girl of twenty, has regained some use of the legs and one arm so that she may hope to walk with braces and crutches She is probably the most hopeful case of the whole series This is the group from which most is to be expected, and the only one in which we might hope the respirator would serve us well Yet it will be seen from the observation of the nine cases that the death rate is high and that those whose lives have been saved are invalids

In the second group, with true bulbar poliomyelitis, there is no paralysis of the muscles of respiration Just what the cause of respiratory failure in these cases is we do not know Undoubtedly, however, there is some disruption of function in the bulb which leads to respiratory distress Many of these patients develop a peculiar inspiratory-gasping type of breathing, as mentioned by Wilson, and this is frequently associated with a pulse of 140-160 Both these signs may be due to bulbar vagal involvement Some of these bulbar cases retain a considerable amount of mucus in the mouth and throat, of which they are unable to rid themselves, which proves to be a serious complication Vomiting is a second complication and often the vomitus, being only partially expelled, further plugs and irritates the air passages A few of the bulbar cases are not of this "wet" type, but these are milder in nature

One would not expect the Drinker machine to be effective in such cases since its purely mechanical action is of no value in combating the pathological function of the medullary "centres" Many of these patients will not synchronize their respiration with the machine, and even with heavy dosage of morphine to inhibit the respiratory centre, the short, ineffective gasps continue To combat the dangers from the excess of mucus we have used postural drainage, atropine, and the mechanical sucking apparatus These give only temporary and partial relief and the patients usually drown in their own secretions One patient in our series, moreover, developed a bilateral laryngeal paralysis, and an emergency tracheotomy had to be performed

Since we cannot be certain what the mechanism is in patients of this second group, and since we have no other treatment, we have tried the Drinker respirator in all cases of pure bulbar poliomyelitis with respiratory embarrassment From the point of view of after-life this should be the most worth-while group, since if there is recovery, there is no distressing crippling or invalidism Ten patients have been treated in the past three years None recovered, nor was life prolonged beyond the acute

stage in any of them They were in the respirator for varying intervals, the shortest time being one hour and the longest seventy-two hours All were of the "wet" type

As the result of the above study, we have come to regard certain signs as of grave prognostic significance in cases of bulbar poliomyelitis (1) vomiting after the prodromal period, (2) rapid pulse, (3) retained mucus in the throat, and (4) gasping, inspiratory efforts A further sign, which needs confirmation, is the persistence of excessive amounts of sugar in the spinal fluid

The exact cause of death in bulbar poliomyelitis has not been determined Clinically, the patients remain cyanotic in the respirator, even when oxygen and carbon dioxide are administered Anoxemia is, therefore, always present The rapid rate of the heart also leads to circulatory failure and possibly to inefficient circulation in the lungs and medulla itself, so that a vicious circle is established A further cause for embarrassment of the respiratory function is edema of the lungs, a finding often confirmed at necropsy Irrationality and delirium, out of proportion to the temperature, were frequently observed

In this group then, experience bears out our theoretical considerations None of these ten patients have survived, nor has life been significantly prolonged by the use of the Drinker respirator

The third group are either cases of the ascending type with involvement of both the respiratory muscles and the bulbar centre, or of the descending type, with similar involvement Some patients have started with paralysis of the intercostal muscles and the process has then migrated both up and down the central nervous system As a means of treatment, the respirator is effective in inverse proportion to the amount of bulbar involvement The complications presented are those of the first two groups

Five such patients have been treated in the respirator Three of these patients died, two have survived One of those who survived had, on entry, a bilateral facial paralysis as well as total paralysis of both arms and legs Shortly after admission the child became cyanotic, was placed in a respirator, and in a few days could be out for a short while at a time At no time was there any involvement of the cranial nerves other than the facials, excessive mucus, rapid pulse, vomiting, or gasping respiration were not observed It is presumed that the respiratory difficulty in this case was due, entirely or for the most part, to intercostal and diaphragmatic paralysis This child left the hospital with practically complete paralysis of both legs but is now, two years later, able to be about with braces

The second survivor in this group is a case of only two and one-half months' duration. When first seen, there was extensive paralysis of the arms, legs and trunk as well as of the intercostals and diaphragm, diplopia and slight temporary difficulty in swallowing. There were no other cranial nerve palsies at any time and this patient likewise did not show the unfavorable bulbar signs noted above. It is probable here also that the respiratory difficulty was due to paresis of the intercostal muscles and diaphragm rather than to bulbar respiratory involvement. At present, the patient is still in the respirator all of the night and two hours during the day. There is still extensive paralysis of the arms, legs and trunk muscles.

Of the three cases in the third group who died, two were of the ascending and one of the descending type. All died of the bulbar disturbances mentioned above.

The age distribution of the whole twenty-four cases is quite wide. The youngest patient was five years old, the oldest thirty-six. Eight were under fourteen years of age, of these four have survived. Sixteen of the patients were fourteen or over and of these, three are living and thirteen are dead.

CONCLUSIONS

1 A group of twenty-four patients with acute poliomyelitis treated in the Drinker respirator has been reviewed.

2 These twenty-four cases are divided into three groups, dependent on the primary cause of respiratory failure: (1) involvement of the respiratory muscles, (2) involvement of the bulbar "centres", (3) involvement of both mechanisms.

3 In the first group, patients with respiratory muscle involvement, there were nine cases. Of these five died and four survive. Two of the four survivors have been followed for two years and are invalids confined to bed. The other two have been followed for one year, one of these is completely paralyzed in legs, arms, and trunk, and confined to bed, the other shows sufficient recovery to justify the hope that she may walk with the aid of braces and crutches. This is the group in which the respirator could, theoretically, be expected to be of most value.

4 In the second group, patients with bulbar involvement, there were ten cases. All of these were fatal. The possible causes of death are discussed and reasons are brought forward to demonstrate that the respirator may not be expected to aid in such cases. In the bulbar cases the most unfavorable signs are the following: (1) a rapid pulse, (2) excessive mucus, (3) vomiting after the prodromal period, (4) short, gasping inspiratory efforts, and (5) persistence of a high spinal fluid sugar.

5 In the third group there are five cases. Of these, three were fatal and two survived. One of the survivors had little or no involvement of his medulla but presented a nearly complete paralysis of arms and legs. He is on braces now, after two years, with almost no use of his arms. The second survivor has been followed for only two and one-half months. He also had little and temporary involvement of cranial nerves. He has at present, an extensive paralysis of arms, legs and trunk and spends all night and two hours during the day in the machine. It is felt that respiratory difficulty in both these cases was due to intercostal and diaphragmatic paresis and not to bulbar involvement.

6 Of twenty-four patients treated with the Drinker respirator, eighteen are dead and six are living. Of the six who survived, some will be permanently paralyzed.

7 Two patients who were in the respirator for the longest periods developed extreme dilatation of the ureters and renal pelvis, probably as a result of the action of gravity on the ureters as they pass over the pelvic brim.

8 It is felt that the use of the respirator is always justified in poliomyelitis for symptomatic relief, and that most is to be hoped for in those cases with intercostal and diaphragmatic paralysis. The most unfavorable type is that in which the respiratory difficulty is due to bulbar involvement.

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HERNIATION OF THE FUNDUS OF THE STOMACH THROUGH THE ESOPHAGEAL HIATUS WITH SPECIAL REFERENCE TO ITS ROENTGENOLOGIC DIAGNOSIS

BY LAWRIE B. MORRISON, M.D.,* SIDNEY L. MORRISON, M.D.,* AND JOSEPH H. DELANEY, B.S.*

INTRODUCTION

DIAPHRAGMATIC hernia is one of the hidden deformities which has always attracted considerable attention. As a result of this interest a large literature has accumulated, dealing with the embryology, anatomy, classification, differential diagnosis, roentgenologic study and treatment of the condition. In this paper we propose to consider only the esophageal orifice hernias, paying particular attention to their roentgenologic study. As here used the term, esophageal orifice hernia, applies to a protrusion of a portion of the fundus of the stomach through the esophageal hiatus of the diaphragm into the thorax. This condition is far from common and not until the roentgen ray became generally used was it possible to make a definite diagnosis during life. The question is pertinent: Is it as rare a condition as it was formerly thought to be?

Ambrose Paré¹ and Jean Petit² are both credited with being the first to describe a diaphragmatic hernia. In 1575 Paré reported two cases of traumatic herniae, and in the 1844 edition of Petit's "Malaise Des Os Oeuvres Completes" we find reference to two cases, one traumatic and one congenital. In 1769 Morgagni³ prepared a monograph on diaphragmatic hernia and mentioned herniation through the esophageal hiatus. Bowditch⁴ in 1853 collected 88 cases from the literature and Lacher⁵ in 1880 tabulated 117 congenital and 150 traumatic cases.

Since the advent of the roentgen ray at the beginning of the twentieth century, and especially since the use of the opaque meal in 1905, cases have accumulated with greater rapidity. In 1911 Eppinger⁶ tabulated 653 cases of hernia through the various parts of the diaphragm, eleven of which involved the esophageal orifice. The next year Giffin⁷ summarized the literature and found that, of 650 cases reported, only 15 were diagnosed during the life of the patient. Breitner⁸ found that of the large number of cases reported up to 1921 only 45 were diagnosed during life. Richards⁹ tabulated 137 cases from 1900 to 1923 and found that, of these, 23 were through the esophageal orifice.

The literature of the past decade indicates that herniation of the fundus through the esophageal hiatus is more common than is supposed. Thus in 1924 Carman and Fineman¹⁰ reported 12 cases, six of which involved only varying

portions of the fundus of the stomach. L. B. Morrison¹¹ in 1922 reported 12 cases of congenital hernia of a portion of the fundus. In 1925¹² this number was increased to 42 cases out of 3,500 gastric cases studied and the next year Healy¹³ reported that this series had been further increased to 53. Up to date they have observed 314 cases of herniation of the fundus of the stomach.¹⁴ In 1926 Pancoast and Boles¹⁵ reported 20 cases from the Mayo Clinic, 15 of which were found in 1923-1924. In 1925 Hedblom¹⁶ analyzed 378 cases from the literature. Of this number 163 cases were described as to location, twenty per cent of which were esophageal hernias. Akerlund¹⁷ reported 30 cases of hiatal hernias in 1926 and found 60 others in the literature. Truesdale¹⁸ has reported numerous cases of diaphragmatic hernia with operative treatment during the past decade. Greenwald and Steiner¹⁹ found 82 cases of diaphragmatic hernia in childhood reported in the literature between 1912 and 1923. In 1929 Ude and Rigler²⁰ reported 19 cases of hernia through the esophageal orifice. They are of the opinion that this is the most frequent site of diaphragmatic hernia. In 1930 Ritvo²¹ reported 60 cases of esophageal hiatus hernias which he had observed over a period of five years. In 1931 Hedblom²² again summarized the literature and tabulated 1435 cases. Of this number 190 were exclusively esophageal hiatus hernias diagnosed roentgenologically. He points out that careful roentgenologic examination has revealed a relatively large number of small hernias. If the cases so revealed by roentgenologists were added to those which he tabulated "the esophageal hiatus hernias would represent over two thirds of the non traumatic type and over one-third of all the reported cases." Harrington²³ is of the opinion that hernia of the fundus of the stomach through the esophageal orifice is the most frequent of the various types of diaphragmatic hernia.

EMBRYOLOGY

The anlage of the pericardial, pleural and peritoneal cavities, the embryonic coelom, is formed by the end of the fourth week as two parallel canals on either side of the midline by the coalescence of clefts in the mesoderm. These two canals soon unite at the anterior extremity of the embryo to form a horseshoe shaped pericardial cavity.²⁴ Dorsal to this cavity lies the foregut, which has invaginated while the cavities were forming, and ventrally it is closed off by the infolding and fusion of the splanchnopleure. Coincidental with the descent of the

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primitive diaphragm and the increasing flexion of the embryo, the pericardial cavity comes to lie nearly at right angles to the plane of the paired pleuroperitoneal cavities and communicates with them dorsocaudally. These paired cavities are separated from one another longitudinally by the primitive mediastinum and the mesentery. With the caudal extension of the gut and the disappearance of the caudal portion of the ventral mesentery, the peritoneal portion of the parallel canals unite to form the common peritoneal cavity. The pleuroperitoneal cavities at first communicate laterally with the extra-embryonic coelom, but by the formation of the common peritoneal cavity and the infolding of the splanchnopleure on each side they become entirely separated, leaving the umbilicus as the last point of closure.

The division of the coelom into separate cavities is begun by the fourth week. This is accomplished by the following membranes: (1) the dorsal mesentery, (2) the septum transversum, (3) the paired pleuropericardial membrane, and (4) the paired pleuroperitoneal membranes.

The septum transversum (His) arises during the third week as a mass of mesodermal cells along the walls of the vitelline veins as they pass in the ventral mesentery to the heart, paralleling the foregut. These vessels bulge laterally into the coelom and with progressive enlargement finally meet and fuse with the somatic mesoderm. This forms a transverse partition caudal to the heart, separating the pericardial and the peritoneal cavities ventral to the gut. Dorsally the septum is incomplete and here a communication exists on each side between the pericardial and the pleuroperitoneal cavities. These passages are known as the pleuroperitoneal canals in which lung buds develop. The septum transversum is early differentiated into two portions, a cephalic lobe which is the anlage of a large part of the diaphragm and the floor of the pericardial cavity, and a caudal lobe into which the liver penetrates.

In the 2 mm embryo the septum transversum lies in the cervical region, occupying a transverse position. It then migrates caudally, reaching its final location opposite the first lumbar segment in the second month.

The complete separation of the pericardial, pleural and peritoneal cavities is accomplished by the formation of the pleuropericardial and pleuroperitoneal membranes. The chief structures concerned in this process are the common cardinal veins (ducts of Cuvier), which lie in the lateral walls. They curve around the pleuroperitoneal canals, passing from the dorsolateral walls and bulge into the canals. This constriction is called by Mall the pulmonary ridge. The anterior portion of the ridge forms the pleuropericardial membrane and later separates the pleural and pericardial cavities. Its caudal portion constitutes the pleuroperitoneal mem-

brane and separates dorsolaterally the pleural and peritoneal cavities.⁹ The dorsal mesentery contributes the dorsomedial part of the diaphragm, including the area through which the esophagus and vena cava pass. The failure of the pleuroperitoneal membrane to close, results in the herniation of abdominal viscera at this point.²⁰ After its formation the pleuroperitoneal membrane lies anterior to a portion of the lung and encircles it. The dorsal end of the septum transversum descends more rapidly at this time than its ventral portion, thus bringing the pleuroperitoneal membrane to a position caudal to the lung. The pleuropericardial membrane is held behind during this migration by the phrenic nerve which passes through it. The lung now occupies a cone-shaped cavity between the pleuropericardial and pleuroperitoneal membranes. The further migration of the septum transversum brings these structures to lie at right angles to one another. The final closure of the pleuroperitoneal and pleuropericardial membranes occurs at the 19 to 20 mm stage. The right pleuroperitoneal canal closes first due to the presence of the right lobe of the liver.

The primitive diaphragm thus formed is made up of mesenchymal substance. Its muscle elements originate in a pair of cervical myomeres at the fifth cervical segment. They grow in from the lateral wall, aided by the pressure of the expanding lungs. The distribution of the muscle tissue when complete is uniform throughout. The central tendinous portion results from atrophy of the muscle in this area.

The development of the omental bursa is another embryological factor of significance in the etiology of esophageal hiatus hernias. The structure appears in the 3 mm embryo as a finger-like projection of the peritoneal cavity into the dorsal mesentery on either side of the esophagus. The projection on the left is normally obliterated at an early stage but the one on the right persists for some time and eventually gives rise to the omental bursa. Normally this is constricted off at the esophagogastric junction after the descent of the stomach into the peritoneal cavity and is obliterated. It may persist at the side of the esophagus and thus form a likely spot for herniation of the stomach.

The stomach appears in embryos of 4 to 5 mm. as a lateral fusiform enlargement of the foregut caudal to the lung anlagen.²⁴ It grows slowly at first and remains above the septum transversum up to the 11 to 12 mm. stage. It then moves caudally with the rapid elongation of the esophagus so that it lies caudal to the diaphragm by the time of its closure in the 19 to 20 mm embryo. The stomach is attached to the dorsal wall by its dorsal or greater omentum and to the liver by its ventral or lesser omentum. The rapid growth of the dorsal border produces the fundus, the characteristic les-

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DIAPHRAGMATIC hernia is one of the hidden deformities which has always attracted considerable attention. As a result of this interest a large literature has accumulated, dealing with the embryology, anatomy, classification, differential diagnosis, roentgenologic study and treatment of the condition. In this paper we propose to consider only the esophageal orifice hernias, paying particular attention to their roentgenologic study. As here used the term, esophageal orifice hernia, applies to a protrusion of a portion of the fundus of the stomach through the esophageal hiatus of the diaphragm into the thorax. This condition is far from common and not until the roentgen ray became generally used was it possible to make a definite diagnosis during life. The question is pertinent: Is it as rare a condition as it was formerly thought to be?

Ambroise Paré¹ and Jean Petit² are both credited with being the first to describe a diaphragmatic hernia. In 1575 Paré reported two cases of traumatic herniae, and in the 1844 edition of Petit's "Malaise Des Os Oeuvres Completes" we find reference to two cases, one traumatic and one congenital. In 1769 Morgagni³ prepared a monograph on diaphragmatic hernia and mentioned herniation through the esophageal hiatus. Bowditch⁴ in 1853 collected 88 cases from the literature and Lacher⁵ in 1880 tabulated 117 congenital and 150 traumatic cases.

Since the advent of the roentgen ray at the beginning of the twentieth century, and especially since the use of the opaque meal in 1905, cases have accumulated with greater rapidity. In 1911 Eppinger⁶ tabulated 653 cases of hernia through the various parts of the diaphragm, eleven of which involved the esophageal orifice. The next year Giffin⁷ summarized the literature and found that, of 650 cases reported, only 15 were diagnosed during the life of the patient. Breitner⁸ found that of the large number of cases reported up to 1921 only 45 were diagnosed during life. Richards⁹ tabulated 137 cases from 1900 to 1923 and found that, of these, 23 were through the esophageal orifice.

The literature of the past decade indicates that herniation of the fundus through the esophageal hiatus is more common than is supposed. Thus in 1924 Carman and Fineman¹⁰ reported 12 cases, six of which involved only varying

portions of the fundus of the stomach. L. B. Morrison¹¹ in 1922 reported 12 cases of congenital hernia of a portion of the fundus. In 1925¹² this number was increased to 42 cases out of 3,500 gastric cases studied and the next year Healy¹³ reported that this series had been further increased to 53. Up to date they have observed 314 cases of herniation of the fundus of the stomach.¹⁴ In 1926 Pancoast and Boles¹⁵ reported 20 cases from the Mayo Clinic, 15 of which were found in 1923-1924. In 1925 Hedblom¹⁶ analyzed 378 cases from the literature. Of this number 163 cases were described as to location, twenty per cent of which were esophageal hernias. Akerlund¹⁷ reported 30 cases of hiatal hernias in 1926 and found 60 others in the literature. Truesdale¹⁸ has reported numerous cases of diaphragmatic hernia with operative treatment during the past decade. Greenwald and Steiner¹⁹ found 82 cases of diaphragmatic hernia in childhood reported in the literature between 1912 and 1923. In 1929 Ude and Rigler²⁰ reported 19 cases of hernia through the esophageal orifice. They are of the opinion that this is the most frequent site of diaphragmatic hernia. In 1930 Ritvo²¹ reported 60 cases of esophageal hiatus hernias which he had observed over a period of five years. In 1931 Hedblom²² again summarized the literature and tabulated 1435 cases. Of this number 190 were exclusively esophageal hiatus hernias diagnosed roentgenologically. He points out that careful roentgenologic examination has revealed a relatively large number of small hernias. If the cases so revealed by roentgenologists were added to those which he tabulated "the esophageal hiatus hernias would represent over two-thirds of the non-traumatic type and over one-third of all the reported cases." Harrington²³ is of the opinion that hernia of the fundus of the stomach through the esophageal orifice is the most frequent of the various types of diaphragmatic hernia.

EMBRYOLOGY

The anlage of the pericardial, pleural and peritoneal cavities, the embryonic coelom, is formed by the end of the fourth week as two parallel canals on either side of the midline by the coalescence of clefts in the mesoderm. These two canals soon unite at the anterior extremity of the embryo to form a horseshoe shaped pericardial cavity.²⁴ Dorsal to this cavity lies the foregut, which has invaginated while the cavities were forming, and ventrally it is closed off by the infolding and fusion of the splanchnopleure. Coincidental with the descent of the

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this condition. Here again Bund's²⁸ theory may be applied. If for any reason the infracardiac bursa, which at an early stage communicates with the omental bursa and hence with the general abdominal cavity, should persist and remain open below, there would then be formed a passage beside the esophagus and through the diaphragm. This would afford an extremely vulnerable spot for a viscus to force its way upward along the esophagus, through the muscular ring, simulating in every way a general dilatation of the opening.

Since the esophagus is of normal length with its distal end in the abdomen, these cases are amenable to surgery provided no adhesions have formed and the enlarged orifice can be sutured together.

Between this group of cases and the third type of hiatal hernias there are many transitional forms. This last group of hiatal hernias are those in which no short esophagus exists and which are not paraesophageal. The lower end of the esophagus and the fundus of the stomach have both passed up through the enlarged hiatus as part of the hernia. The esophagus is relaxed, may become tortuous and forms no hindrance for replacement of the hernia, provided no adhesions have developed. These, the largest of the hernias through the esophageal hiatus are apt to give the most severe symptoms of hiatal hernias and include the majority of the operative cases. The etiological factors are the same as for the paraesophageal hernias.

Other abdominal organs in addition to the stomach will herniate through an enlarged esophageal hiatus. The colon and the small intestine are the most frequent offenders. As a point of fact every abdominal organ with the exception of those in the pelvis has been found in the thorax in hernias through various parts of the diaphragm.

SYMPTOMS

Diaphragmatic hernia is surprisingly variable in its symptomatic manifestations. There is no one characteristic symptom or syndrome which points unmistakably to such a lesion. The complaints of the patient depend chiefly upon the organs involved in the hernia, the extent to which their normal function is disturbed, and the degree to which the presence of abdominal viscera in the thorax impairs respiration and circulation. Hernia may exist symptomless for years only to be discovered during a routine roentgenologic examination of the chest or abdomen, at operation for some other cause or at postmortem examination. Many of the cases reported in the literature have been free from symptoms due directly or indirectly to the hernia.

The symptoms may be referable to the thorax or abdomen, or to both. Of the abdominal manifestations, vague pain or distress just under

the ensiform process during or after meals is the most common. Frequently this dull pain starts in front, radiates to the back in the infra- or supra-scapular regions, thus resembling a chronic cholecystitis. Often the pain radiates to the left shoulder. This pain together with the regurgitation of recently digested food particularly if the patient is in the recumbent position is the most characteristic symptom of hiatal hernias. Patients soon learn that this is relieved by standing up or walking around. This type of pain together with its remedy is often very suggestive of this condition. Night awakening with abdominal distress, nausea and vomiting of a foamy acid residue occurs. Constipation is often associated with this condition and melena is frequently present. A secondary anemia is not at all uncommon. Some patients complain of difficulty in swallowing, which is probably due to pressure of the herniated portion of the stomach on the esophagus. Gaseous eructations and heartburn are frequent symptoms.

A feeling of fullness in the chest after eating or retiring is the most common thoracic manifestation. Dyspnea, cyanosis, palpitation and a feeling of suffocation or pain have been reported. Hiccup and cough are occasionally noted.

All of these symptoms, both abdominal and thoracic, are more severe when large quantities of food are taken, and are usually relieved by standing up or by vomiting. On the whole they are usually mild. As the stomach is the only organ herniated in most cases, the symptoms are mostly gastric in type.

SIGNS

The physical signs vary with the size of the hernia and the position of the herniated organ, since the change in physical findings is chiefly due to the presence of abdominal viscera in the thorax. Patients with long-standing hernias may show only an emaciation due to the inability to take and retain sufficient food. The percussion note may vary from tympany to dullness, depending upon the size and content of the herniation. A small peripheral hernia may produce distinct changes, while a large hernia in the posterior mediastinum may not alter the percussion note. Displacement of the heart has been noted with large hernias. However tympany over the lower central portion of the thorax, changing to dullness when food or drink is taken, is perhaps the most frequent finding, if any signs at all can be demonstrated.

Should a portion of the colon or small intestine become involved in the hernia the symptoms and signs will become more marked. Even the findings of partial or complete obstruction may appear.

DIAGNOSIS

The variation and vagueness in the symptoms and signs makes a positive clinical diagnosis

ser and greater curvatures and the rotation to the right on the long axis

Should there be any retardation in the growth of the esophagus, any portion of the stomach that may have failed to reach its normal position at the time of the closure of the diaphragm will be retained in the thoracic cavity

CLASSIFICATION OF ESOPHAGEAL HIATUS HERNIAS

In 1922 L. B. Morrison¹¹ reported before the New England Roentgen Ray Society the first twelve of his series of cases which he termed "congenital hernia of a portion of the fundus of the stomach through the esophageal hiatus," and at that time made reference to the short esophageal type of hernia. In 1926 Akerlund¹⁷ published a paper on this subject based on the roentgenologic examination of 30 cases. He proposed that this condition of herniation of the fundus through the esophageal hiatus be called "diaphragmatic hernia of the esophageal hiatus" or "hiatal hernias." He differentiated all such hernias into three groups on an anatomical basis, among which there are certain transitional forms. His classification is as follows:

1 Hiatus hernias with congenitally short esophagus

2 Paraesophageal hiatus hernias in which the esophagus is not short and is not herniated

3 Other hiatus hernias in which the esophagus is not shortened, but in which the distal portion of the esophagus is a part of the hernial contents

Of these hernias the last group is the most common while the short esophageal type is the most rare

ETIOLOGY AND PATHOLOGY

In the hiatus hernia with shortened esophagus the distal portion of the esophagus does not reach the level of the hiatus of the diaphragm. Consequently a varying amount of the stomach comes to lie in the thorax. In this type, the esophagus ends a little more than a finger-breadth to 7 or 8 cm above the plane of the diaphragm and the fundus lies within the hiatus. When the major portion or all of the stomach is in the thorax, the condition is called "Thoracic Stomach." Bailey²⁰ in 1919 is usually credited with first describing this condition, but Bright²⁷ reported a case from Guy's Hospital in 1836, and Bund²⁸ reported a case in 1918. We found at least 18 undoubted cases of thoracic stomach in the literature. Bailey states that "there is no evidence that the stomach had herniated into the thorax. Its positions and relations may be explained by supposing that the anlage of the stomach lay abnormally far anterior on the alimentary canal. The peritoneal pocket around the stomach developed before the descent of the diaphragm, and finding

the peritoneal relations already developed, the diaphragm would necessarily leave above it, as it descended, not only the stomach but the expansion of the peritoneal cavity."

There are several other opinions concerning the cause of the short esophagus and the abnormal position of the stomach. Tonndorf²⁹ has suggested that there is an idiopathic failure of the alimentary tract to fix itself at the diaphragmatic anlage thus slowing the descent of the stomach. Bund²⁸ is of the opinion that this abnormality is due to the delayed closure of the right pneumato-enteric recess (omental bursa) along the esophagus, and that the shortening of the esophagus is secondary.

That this dilated portion of the digestive tract just above the diaphragm in these cases is truly a part of the stomach and not a dilatation or diverticulum of the esophagus has been demonstrated by three methods. Findlay and Brown Kelley³⁰, reported that they had shown this to be stomach by esophagoscopy examination. They further demonstrated this by an histologic study of a portion of tissue removed from the dilated area during such an esophagoscopy examination. Roentgenologically the difference between the esophagus and the herniated stomach can be seen by the change in the peristaltic movements and the presence of rugae.

Reposition of the herniated stomach into the abdomen is well-nigh impossible since it is held in its abnormal position by the esophagus which is relatively short for that particular patient.

The paraesophageal hernias form a significant group, occurring often in old people, particularly in women. A portion of the stomach passes upward between the esophagus and the enlarged hernial ring, protruding into the thorax. The lower end of the esophagus and the cardia remain below the diaphragm. Strictly speaking, there is normally no "esophageal opening", that is the digestive tract is everywhere intimately enclosed by the dorsal, and above the diaphragm by the ventral mesentery, through which the esophagus passes. The only "opening" is that created by the failure of the diaphragmatic muscle to closely surround the esophagus. The more the muscle fails to do this the greater is the amount of the membranous partition composed of peritoneum, pleura and interstitial tissue, which under certain conditions, may become the site of a hernia. For this reason the esophageal hernias are commonly contained in a sac formed of relaxed membranous tissue. The great majority of them as found in adults, are of the acquired type and result from repeated increase in intra-abdominal pressure occurring with coughing or straining. This pressure transmitted by the stomach to the hiatus causes a pressure atrophy of the ligamentous and muscular tissue of a hiatal ring, which, perhaps, is already abnormally large or weakened, thus causing further enlargement. Then, too, there are the congenital cases of

slight variations in the size of the esophagus. When it reached the diaphragm, in the normal individual there seems to be a pinchcock effect that has been so nicely described by Chevalier Jackson³³. This opens up and allows a bolus of food to pass through the esophageal hiatus, down that portion of the esophagus below the diaphragm and into the stomach approximately one inch below. This abdominal portion of the esophagus may be of variable length depending upon the shape of the fundus of the stomach. One must carefully observe the cardiac orifice of the esophagus and the size of the hiatus must be watched as the esophagus empties. As the mucosa of the esophagus comes into mutual contact we notice the longitudinal lines where the barium projects into the various folds of the esophagus. These folds are characteristic of the esophagus and have been described by Mosher³⁴. The peristaltic waves over the esophagus are typically smooth and even throughout its length.

In the study of the normal fundus of the stomach in relation to the cardia we find that the esophagus, as seen in the fluoroscope or plate, extends down posterior to that portion of the fundus which lies anterior to the esophageal hiatus. In some instances the esophagus comes down to the right of the stomach and then crosses to the left at an oblique angle and enters the fundus much as we see in anatomical dissections.

It is observed in certain stomachs which may be described as of the infantile type where the esophagus barely passes through the diaphragmatic orifice before it empties into the fundus. The esophagus then enters the stomach at its most superior aspect, or a little to the right immediately under the diaphragm rather than crossing obliquely to the left and entering an inch or more below the orifice. This condition undoubtedly represents a transitional form between the normal stomach and the short esophageal type of hiatal hernia. If the stomach is completely filled with the opaque substance and the patient in the supine position inspires deeply, this portion of the fundus projects up into the hiatus similar to the beginning of the protrusion of the omentum or bowel into an inguinal hernia, so that it acts as a potential dilator of the esophageal orifice.

Now, in following this type of stomach a bit farther but with a slightly short esophagus, we find occasionally (in watching the bolus of barium pass down the esophagus) a pinch-cock effect one or two centimeters above the diaphragm. There is a rounded bulge just below this constriction in which the peristalsis differs from that of the esophagus and resembles that of the stomach. It is extremely difficult to plate this and the observations are made mostly with the fluoroscope. A careful observation of this rounded area shows the irregular arrangement of the rugae which we see in the normal fundus of the stomach instead of the parallel

lines in the esophagus above the bulge. This difference can be visualized only while the sac contains a small amount of barium and is obscured if it is completely filled. The appearance of the rugae is an important observation since it together with the change in peristalsis is the roentgenologic proof that the ovoid shadow above the diaphragm is actually a portion of the stomach and not a dilatation or diverticulum of the esophagus. It is interesting to note that in this condition and in the stomach described as infantile that incompetency is a fairly constant observation. It is probably due to a variation of the arrangement of the muscle fibers although this has not been demonstrated anatomically.

In those cases in which the esophagus ends three to five centimeters above the diaphragm a definite portion of the fundus is seen in the thorax. In such a case one may often visualize two slightly constricted areas between which is a dilatation. The superior constriction occurs at the junction of the esophagus and the stomach while the inferior one appears at the level at which the stomach passes through the diaphragm. Either of these may be absent or overlooked in the examination. The esophagus above the dilated area is straight and does not appear kinked as if it were relaxed. One is perfectly certain that such an esophagus is not due to contraction because of the long malposition of the herniated fundus since the walls of the esophagus behave in a normal manner. One should carefully study the relations of the esophagus to the hernia in every instance. This is best accomplished by completely filling the stomach and hernia after the movements and the hernia have been visualized. This is important in differentiating the various types of hernia, in observing the reduction of the hernia and in proving the presence of adhesions.

After making a careful study with the patient in the Menge's position the examination is completed by fluoroscopy with the patient again in the standing position. The purpose of such a procedure is to observe the spontaneous reduction of the hernia under the weight of the barium in the stomach. Thus in the roentgenologic study of the short esophageal hernias the following important factors have been noted:

- (1) No abnormality is noted when the patient is standing.

- (2) There is a gradual transition in a definite sequence from the patient with a normal stomach, through the infantile type with the esophagus entering at the peak of the fundus on to the short esophageal hernias in which the relatively short esophagus enters the fundus above the diaphragm.

- (3) Above the diaphragm two slightly constricted areas may be observed between which is a dilatation characterized by fundal rugae.

- (4) The esophagus is straight.

well-nigh impossible. It is important to recognize that the symptoms of hernia may resemble closely those of the more common abdominal conditions such as gall-bladder disease, peptic ulcer and carcinoma of the esophagus or stomach. Angina pectoris must also be considered at times. Physical findings may be very similar to those of pleuritis or pneumothorax with or without effusion. It must be borne in mind that a hiatal hernia may exist with other lesions. Thus gall-bladder disease or gastric ulcer have been observed in patients with such hernias.

Each of these conditions which must be considered differentially, usually has its typical history and clinical evidence. It is in the atypical cases that diagnosis is difficult and the possibility of esophageal hernia should be recalled. In any case in which the clinical picture in any way suggests diaphragmatic hernia and ordinary study does not establish the diagnosis, the special roentgenologic examination is indicated. As more cases of this type of hernia are recognized and reported the clinical picture will become more clearly defined and this condition will be recognized as a not uncommon cause of upper abdominal distress.

ROENTGENOLOGICAL STUDY

Herniation of the fundus through the esophageal hiatus is one of the concealed abnormalities which roentgenological study has exposed. The clinical evidence is often very suggestive but clinical diagnosis is so uncertain that a thorough roentgenological examination is essential for a final diagnosis.

J M W Morrison²¹ has pointed out that "The number of cases diagnosed apart from x-ray examination is no greater than it was in the eighteenth century, the great majority of cases being discovered in the x-ray room during routine examination of obscure stomach and chest cases, or in the pathology department in the unexpected cases."

The technic of a roentgenological study is exacting and must be carried out with accuracy and care. Roentgenograms are extremely difficult to obtain. Even the most careful technic may fail to show the lesion. This is due to the inability of the patient to remain quiet, the small size and the superimposed shadows of the heart, spine and thoracic cage. The most satisfactory method for obtaining radiograms is to visualize the hernia with the fluoroscope, replace the screen with a film and make the exposure with the patient in exactly the same position. Serial radiograms are occasionally of considerable value.

The roentgenological examination is first made with the patient in the upright position. The anteroposterior and oblique views are obtained. The position and movements of the diaphragm, the cardiac shadow, and the posterior

mediastinum are studied. Occasionally a gas bubble may be observed in the oblique position above the diaphragm. LeWald²² has pointed out that the absence of the usual *magenblase* in the fundus is very suggestive of herniation of the stomach. A fluid level with the gas bubble above it may occasionally be observed in cases in which the fundus and the esophageal opening are above the diaphragm.

A barium meal is then given. There is normally a slight sphincter effect at the cardia occurring with the respiratory movements. The column of fluid is from two to three inches high in the lower esophagus when the barium is rapidly ingested. In the hernia cases the column of fluid may remain four to five inches high. The esophagus seems a trifle dilated. This dilatation does not occur with the short esophageal hernias, but is frequently noted in the other two types of hiatal hernias in which the filled hernia often partially obstructs the esophagus. After the barium has been ingested, an attempt to fill the hernial pouch by deep inspiration and manual pressure on the epigastrium should be made.

Usually the examination in the erect position does not demonstrate the existence of a hiatal hernia unless it is large and partially blocks the esophagus. Consequently if the roentgenological study is limited to this position alone, the majority of the hiatal hernias will be missed. However, one should never fail to examine the esophagus and stomach in the upright position.

The patient is then placed on the fluoroscopic table in the horizontal position. There is no one single position in which it is possible to demonstrate the hernia in every instance. It is essential to study the patient in the prone, supine and oblique positions. Full inspiration and normal pressure on the epigastrium should be used in each position to increase intra abdominal pressure thus forcing the gastric contents into the fundus, cardia and esophagus. The Trendelenburg position, or even slightly elevating the pelvis with a pillow are important aids.

Menge's position is the one position which is most likely to lead to a diagnosis. In this position the patient is lying face down with the right arm extended along the side of the body, left arm on the pillow, and the left knee drawn up so that the body rotates somewhat obliquely to the left, giving a view of the mediastinal space. Often the hernia cannot be observed on the first examination, but a repetition of the study at a later date reveals a rapidly filling pouch. In such cases the failure to make the diagnosis may be due to spontaneous reduction of the hernia at the time of the first examination, or to the fact that the herniated portion is small or lies behind the cardiac shadow.

A thin barium meal given to the patient in Menge's position passed down rather rapidly with peristalsis only moderately visible. The thick barium passed down more slowly, showing

sion and fullness in the thorax. Should distress occur during or after meals, walking about for a few moments usually gives relief. Patients with diaphragmatic hernia should be warned of the possibility of an obstruction and the necessity of surgical intervention.

If the symptoms are severe and the medical treatments give no relief, and if the hernia is of a type amenable to operation, surgery may be resorted to. The dangers of complications and of operation as well as the severity of the symptoms must all be considered. But surgery is not a panacea for hiatal hernias. Hedblom²² points out that "Suture of the hiatus hernial ring may be relatively difficult on account of its relative inaccessibility especially in deep-chested individuals and those with long narrow chests. There is also a good chance of recurrence. The indications for operation on a hiatus hernia are therefore more exacting than any other type as such."

Thoracotomy and laparotomy or a combination of the two have been recommended. However, the abdominal approach is the one of choice for hiatal hernias. The hernia is completely reduced and the enlarged esophageal orifice of the diaphragm sutured to its normal size. Phrenicotomy has been used as a preliminary step to reduce the movements of the diaphragm and thus remove one of the complicating factors in operative procedures.

Harrington⁴¹ has used phrenicotomy as a palliative treatment of cases of hernias in which radical surgical procedures are contraindicated because of the condition of the patient. In order to evaluate the amount of relief to be expected from phrenicotomy he recommends emphysema by crushing or injecting the nerve before completely destroying it. Phrenicotomy may be of some benefit in the treatment of short esophageal hernias. The relaxation of one-half of the diaphragm may be sufficient to reduce pressure on the herniated portion of the stomach thus relieving the symptoms. However this is doubtful since most of the symptoms are due to incompetency of the cardia. Fortunately most of the cases of hiatal hernias have only mild symptoms and surgical intervention is rarely indicated.

CONCLUSIONS

1. Herniation of a portion of the fundus of the stomach through the esophageal hiatus is a more common condition than formerly thought. The increased number of roentgenologic examinations of the gastro-intestinal tract has resulted in more frequent diagnosis. Although no exact figures are obtainable in the literature, it is estimated that hiatal hernias represent approximately two-thirds of the non-traumatic and one-third of all the cases of diaphragmatic hernia.

2. Hiatal hernias may be divided anatomically into three groups:

- 1 Short esophageal hernias
- 2 Para-esophageal hernias
- 3 Hernias in which the esophagus is not shortened but the distal end is included in the hernial sac

3. Short esophageal hernias may be the result of an abnormally far anterior position of the anlage of the stomach on the digestive tube, or to an idiopathic delay in the elongation of the esophagus. The other types may be congenital or acquired. Congenital cases result from a delay in the closure of the ommental bursa. Acquired forms result from indirect trauma due to increased intra-abdominal pressure.

4. There is no characteristic symptom or syndrome diagnostic of this condition. The most common complaint is a dull pain under the ensiform, accompanied by regurgitation when in the recumbent position.

5. Physical signs are unsatisfactory.

6. Definite diagnosis may be made only with the roentgen ray. Careful fluoroscopic examinations are essential with the patient in the prone, supine and oblique positions. Menge's position is the most satisfactory. Roentgenograms are difficult to make.

7. There is a definite sequence in the types of stomachs as seen in the roentgenologic studies. This sequence goes from the normal stomach through the "infantile type" with the esophagus entering at the peak of the fundus, to the short esophageal hernias and finally to the condition of thoracic stomach.

8. Roentgenologic differentiation of the three types of hiatal hernias is possible in typical cases.

9. Treatment consists in dietary and preventive management. Surgical repair may be resorted to in cases with severe, unrelieved symptoms. Reduction of short esophageal hernias is usually unsuccessful. Phrenicotomy may be done as a surgical measure in hiatal hernias where radical operation is contraindicated and as a pre-operative procedure for reduction. It may be of benefit in short esophageal hernias. Recurrences of hiatal hernias are frequent.

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(5) The herniated portion is never reduced when the patient assumes the upright position

In the para-esophageal hernias the *magen-blase* may appear normal. Usually, however, it is small and pushed to one side. The barium is seen to run down the esophagus and enter the stomach. As the stomach distends, the barium appears around or to one side of the esophagus which is already filled by the opaque substance as it is passing downward. The hernia may appear to the right, left, front or back of the esophagus, usually to the left and posterior. In some cases it may appear to surround the esophagus.

The fluoroscopic study of the third type of hiatal hernia is characteristic enough in typical cases to permit a differential diagnosis. The esophagus is usually seen to be tortuous or relaxed. It enters the fundus above the diaphragm, and the characteristic rugae are seen in the thorax. The spontaneous reduction of the hernia may be seen under the fluoroscope. The tortuosity of the esophagus disappears with such a reduction.

It should be pointed out that roentgenological differentiation of these three groups of hiatal hernias is not an easy task and is uncertain. It may be considered that such a differentiation is only of academic importance. However, a diagnosis is possible in typical cases and should be made in order for the roentgenologist to offer recommendations for the type of treatment to be followed.

Roentgenologic differential diagnosis of hiatal hernias includes diaphragmatic hernia of other types, eventration, absence of the left half of the diaphragm⁸⁵, esophageal and gastric diverticula, cardiospasm, cardio-esophageal relaxation and hour-glass stomach.

Diaphragmatic hernia of other types than the hiatus hernias may involve any portion of the diaphragm and include other organs than the stomach. The site of the hernial opening, the relation to the esophagus and organs involved may be demonstrated by the barium meal or enema. Differentiation of eventration and hiatus hernias depends on the visualization of abdominal organs below an elevated dome of the diaphragm. Kirklin⁸⁶ points out that in eventration the upper level of the stomach contents is at the hiatus, while in hernia of the stomach it is apt to be above it. "Absence of the left half of the diaphragm may be best noted in a lateral examination. In this position in the normal person, both the right and the left leaves of the diaphragm can be seen throughout their entire extent, hence, the absence of one leaf or a portion of it can be readily determined. In eventration of the diaphragm, no matter how thin or how high the outline of the diaphragm, it can be determined."⁸⁴

Diverticulum of the esophagus always lies in contact with the esophagus. It fills directly from the esophagus, lies well above the dia-

phragm and is best seen when the patient is erect. A hernia fills from the stomach, is in contact with the diaphragm, is seldom seen except in the horizontal position and gastric rugae may be demonstrated. A diverticulum of the stomach is below the level of the diaphragm, fills from the stomach in the upright position and retention of opaque material is noted after the stomach has emptied.

Cardiospasm is characterized roentgenologically by a high column of barium in the esophagus, and a dilatation of the esophagus above a constricted area. In cardio-esophageal relaxation the barium descends quickly into the stomach, and is seen to run back when the patient is recumbent. No hernial sac above the diaphragm can be visualized in either of these conditions.

Hour-glass stomach may be distinguished by the fact that it lies below the diaphragm and the *media enters the upper portion of the stomach* first while in hiatus hernia the barium enters the lower intra-abdominal portion first.

TREATMENT

The treatment of esophageal hiatus hernias may be either medical or surgical. The decision as to which of these resources is to be followed rests upon two factors, the severity of the symptoms and the roentgenological findings. Should the roentgenological studies reveal that the hernia is of the short esophageal type, surgical intervention, retraction of the stomach and suture of the diaphragm will probably be unsuccessful. The roentgenologist may further be of assistance by observing the size of the hernia, the symptoms when the hernial sac is filled, and the amount of dilatation of the esophagus. He can also suggest the site of operation, whether the approach should be thoracic or abdominal, by determining the position of the diaphragm, the width of the angle at the ensiform cartilage and the extent of ossification seen in the costochondral junction.

Medical treatment is entirely symptomatic and varies with the individual case. It consists largely in preventive measures and dietary management. The patient should be directed to avoid all conditions which increase intra-abdominal pressure such as vomiting, straining at stool, sudden severe exertion, or tight abdominal bands. The avoidance of overdistention of the stomach with large amounts of food or fluid is important. Gaseous distention and constipation should be remedied. Patients should be put on a dietary régime consisting of frequent small meals of high caloric value. The problem here is to maintain nutrition and to avoid having large amounts of food in the stomach at any one time. Cabot⁸⁷, Crohn⁸⁸, and Schusler⁸⁹, have reported cases which have been successfully treated by strict diet. Any variation from the diet resulted in return of symptoms. The patient should not lie down immediately after eating as this is apt to cause a feeling of oppres-

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PRACTICAL FEATURES IN THE STUDY AND TREATMENT OF ANXIETY STATES*

BY ESTHER LORING RICHARDS, M.D.†

ONE of the most interesting and common symptom-pictures of nerves is that which is comprised in attacks of dyspnea palpitation sweating vertigo, precordial discomfort and often gastro-intestinal manifestations with the predominating emotional accompaniment of apprehensiveness—a vague fear of something going to happen. Its force is best described in the term *angst*—or anxiety. The first person to describe this symptom-picture was a German by the name of Hecker¹ in 1893. He classified it among the symptoms of neurasthenia. Little attention was paid to the observation till 1909 when Freud described the same condition and labeled it anxiety neurosis. In 1912 and 1920 he elaborated² upon the theme. As you know, Freud attempted to divide what had hitherto been known as neurasthenia and hysteria into phsioneuroses and psychoneuroses. Under the phsioneuroses he put neurasthenia (irritable weakness) and anxiety neurosis. He attributed these nervous conditions to some interference with the ordinary physiology of sex functioning. Neurasthenia he ascribed to masturbation or autoerotism and anxiety neuroses to frustrated sexual excitement brought about by a great variety of unfulfilled stimulations and erotic activities. Upon this principle he built an elaborate and ingenious theory which certainly sounds plausible to those who have never spent any thought upon the mechanism of anxiety states or the common variety of situations and facts that may give rise to the same symptom complex. A certain number of our profession following Freud's lead have approached these patients unconsciously determined to find some malfunctioning in the sex life to account for the symptomatology. For example, the practice of coitus interruptus which is one of the commonest birth control methods has been condemned wholesale on the theory that it is pro-

ductive of anxiety attacks. Again anxiety attacks in male and female have been treated with prescriptions of wholesale sex activities on the supposition that the patient was suffering from repressed libido with disastrous results to the health and happiness and full-fledged psychosis as sequelae in many instances. In other words Freud's theory has been made a Procrustes bed to which patients suffering from anxiety attacks must be made to fit. While it is undoubtedly true that frustraneous sexual excitement may give rise to states of anxiety it is not by any means the one and only cause of such conditions as Freud led us to believe for many years. It is interesting to note that in Freud's "Inhibition Symptom and Anxiety" published in 1927³, he has changed his concept of anxiety neuroses which he now believes involve more than just a repressed and unsatisfied libido.

Meantime the medical profession having become aware of this symptom-picture of anxiety states and unwilling to accept or unaware of Freud's conceptions groped its way toward other therapy. Called to see such a patient in the midst of an attack the physician sees an individual sitting up in bed gasping for breath, with wide staring eyes rapid pulse, sweat on the brow and hears the exclamation "Doctor I'm dying. Do something." An equally terrified family stand about opening windows fanning rushing for hot water bag or ice-cap. Their terror is grafted upon that of the patient. The physician ushered into this scene listens to a rapid disturbed heart with an extrasystole or a sinus arrhythmia and speaks as follows: "I think this is nothing serious. You have a nervous heart that is skipping beats. I wouldn't say there is any grave heart disease but you'd better be careful. Go slowly. Don't run for a street car. Lie down if possible for a while after each meal." He may give digitalis and put the patient on a restricted cardiac regime. In this way a third scare is grafted upon the two which the patient has already had. One

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A. Where cardiac symptoms were prominent.	B Where G I symptoms were prominent
1 Angina pectoris	1 Gastro-intestinal disturbance
2 Pseudo-angina pectoris	2 Fallen stomach (dropped)
3 Heart trouble.	3 Spastic colon, g i t. stomach
4 Rapid heart.	4 Chronic constipation.
5 Heart murmur	5 Gastric ulcers
6 Nervous heart.	6 Gall bladder disease
7 "Irritable" or "soldier's heart."	7 Appendicitis
8 High blood pressure	8 Gastric neurosis
9 Low blood pressure	9 Cecal stasis
10 Fast pulse	10 Gastropathy
11 Essential hypertension	11 Functional dyspepsia
12 Effort syndrome	12 Nervous indigestion.
13 Vasomotor instability	

Needless to say all these conditions were ruled out by appropriate examinations in various departments of our General Dispensary

The following are some of the precipitating factors in the anxiety outbursts of these 232 cases

Removal of the teeth, operations, appendectomy

Deaths in family, especially when due to heart trouble

Accidental shooting

Attempted murderous assault

Automobile accident

Fall from wagon

Influenza

Began during the War

Criminal abortions (2) following pregnancy

Quarrel with neighbors

Knowledge of husband's infidelity

Knowledge that husband had syphilis

Worry over step-daughter's sex irregularities

Broken engagement

Irregular or no work Increasing number of family beyond level of economic maintenance Strivings beyond capacity, work under pressure, night courses, and change of vocational activity

Sex conflicts and marital difficulties infidelity, in two cases frigidity of wife, dislike of alcoholic husband, broken engagement, illicit sex relations, conflict about birth control, fear of pregnancy In only two cases did frustraneous sex excitement occupy a prominent place The use of contraceptives was admitted by many The sex difficulties seemed to be more important when there were sex irregularities with conflict, or when "in-laws" were interfering

Alcoholism in husband or parent, mother deserted family, insurance and industrial compensation factors, religious conflicts of Catholic-Protestant marriages, jealousy of younger sibling, father in trouble about bootlegging, husband unstable and depressed

And here are some facts concerning the personality and intellectual assets and biological instabilities of this same group of patients

Over two-thirds of the patients gave definite histories of neurotic tendencies or of neuropathic constitutions dating back to childhood, e.g. bed-wetting nail-biting, "scarciness," timidity jumpiness, night terrors, fear of storms, fear of illness, rumination in infancy, fussiness over food, easy apprehensiveness and excitability during the school period, hives, eczema, hay fever, asthma.

About three-fourths of the patients were mentally retarded or of borderline (twelve to fourteen) intelligence There were few colored patients

From the standpoint of treatment these 232 cases may be divided into three different methods of medical approach, dependent upon whether the physician considered their condition due to cardiac, gastro-intestinal, thyroid or menopausal etiology

Cardiac approaches

Rest from two weeks to months

Digitalis (one case for three years)

Sedatives—luminal, bromide, and codeine, morphia, spirits of ammonia, whisky

No exercise—or light exercise

Gastro-intestinal approaches

X-ray series

Drugs Belladonna or hydrochloric acid

Diets Sippy diet for gastric ulcer

Treated for stomach trouble 30 years

Tonics—fresh air

Enemata for indigestion

Thyroid approaches

Thyroidectomy, iodine rest cures

Miscellaneous approaches

Ovarian extract, dilatation and curettage, endocrine therapy, teeth extractions, protein sensitization

The first point in the treatment of a patient in an anxiety state is to settle the issue of heart or stomach or thyroid condition by a thorough examination of the physiological functioning of which the patient complains This examination should be completed as speedily as possible To drag out such investigations for weeks and months trying digitalis and belladonna and thyroid and ovarian extracts is a psychologically fatal procedure The patient feels no better and suspects all the way along that the doctor is not sure of his ground and is feeling his way along in insecurity The result is that he goes to another doctor, and still to another until his money is exhausted and he is unable to carry on his work, and finally arrives in a dispensary This is the story of these 232 patients already mentioned If the physician is not sure of a heart, or gastro-intestinal condition, excellent specialists are available in

might just as well tell a nervous patient that all his heart valves are leaking like spigots as to damn with such faint praise this organ so fundamental to our well-being

A second method of therapeutic approach is to tell these patients that gas in the stomach is pressing the diaphragm upward, and put them on diets and tincture of belladonna. The result is that the patient's attention becomes fixed on gas, and he gets as panicky with every rumbling of his viscera as a nervous woman in midsummer when a cloud passes over the face of the sun.

A third therapeutic accusation is directed toward that much abused and misunderstood organ, the thyroid gland. Before we had the basal metabolic test, the anxiety neurotic was treated most indiscriminately as a case of hyperthyroidism. Today we are a little more conservative in our operative procedures of ligation and extirpation. It is interesting to note that anxiety attacks show a marked increase in mass health during periods of mass excitement and worry for any reason. For example, in 1918 and 1919, during the "flu" epidemic, these cases were very, very common in private and dispensary practice. We called them "post flu hearts" in those days. But we may well ask ourselves how much of this symptomatology was due to actual influenza heart damage, and how much of it was associated with a high pitch of emotional excitement due to an epidemic that rivaled the black plague in its mortality rate. During the year 1926 when America was sitting comfortably on an inflated economic foundation, we registered only 80 of these patients in the Dispensary of the Henry Phipps Psychiatric Clinic of the Johns Hopkins Hospital. In 1932 when we began to feel the pressure of deflation we registered 232 cases of pure anxiety states in our Henry Phipps Psychiatric Dispensary. We shall go over that figure for 1933.

It would, therefore, seem reasonable to study the symptom-complex of anxiety attacks to see what lies behind in the rank and file of cases. The complaints of palpitation, fluttering, giddiness, heart turning over, sinking spells, shaking, sweating, and flushing, weakness, constriction in the chest, pain around the heart, substernal pressure, shortness of breath, tightness in the throat, fear of being alone, etc., are symptoms with which we all are familiar in states of fear. The receipt of bad news, the necessity of speaking in public, the finding of ourselves in situations of danger call forth in each of us these physiological manifestations of fear. Cannon of Harvard has described for us in detail what fear does to animal physiology. We

pay no attention to these distressing cardiovascular and respiratory and gastro-intestinal body protests because they seem to be a reasonable accompaniment to a definite emotional state. We are afraid of something concrete and perhaps objective such as death of a loved one, financial disaster, personal disgrace, physical danger. Similar body protests in the anxiety patient seem unreasonable because we see no concrete thing happening to him, and this sounds unreasonable to us. But suppose we go back and study the personality of this individual, and see if we can find a reason why he behaves in this way. In doing so we discover that he is invariably a person who all through life has been timid, supersensitive, overanxious, an "easy worrier", extremely conscientious, serious minded. One never finds anxiety states in a phlegmatic temperament. Such an anxiety temperament, prone to go out to meet trouble instead of waiting until it gets to him, is bound to react in an exaggerated way to every sling and arrow of outrageous fortune which he encounters in the pathway of life. He takes life very seriously and very hard. Circumstances which another temperament would make light of and pass over, this kind of an individual broods over, takes to heart, and worries about. His family may not realize it. His friends and business associates may not know it, but the process of temperamental fermentation goes on nevertheless. For weeks and months preceding the condition that we call an anxiety attack, the soil of his conscious processes has been ploughed and harrowed for the reception of some shock or sudden experience. The shock or experience may seem trivial and insignificant to us as we look at it in the light of a single incident or episode. But to him it is the culmination of a long period of anxious worry and mental unrest. This precipitating factor may be an operation, the illness of a child, a financial loss, a demotion, a promotion to a position of responsibility, an accident. One sees the condition frequently in children following a tonsil and adenoid operation which has been preceded for weeks by family conversations about death from taking ether, and hemorrhages, and the terrible things that happen to people in hospitals. Such talk affects an impressionable child, but rolls off a phlegmatic one. Imagine what happens to such a man, woman or child in an anxious state of mind when the physician darkly threatens the patient with fears of some grave systemic condition, and begins a long and tedious series of examinations and hospital experiences and treatments. The following, for example, are some of the diagnostic suspicions entertained by our profession concerning the 232 anxiety neurotics seen in our Dispensary during the year 1932.

remaining 35 per cent fell into the groupings of unmodifiable human material for reasons just described. Let me outline a case or two as typical of symptom-picture and treatment.

Mrs P is a woman of 28 referred from our Medical Dispensary April 1932, for palpitations constant indigestion belching afraid to remain in the house alone, fear of crowds thinks the house is going to cave in on her afraid of dying when she has these spells.

Her present symptoms began six months ago when her husband lost a position which he had had for twelve years, and she and her husband were obliged to reduce the standards of living to which they had been accustomed.

Fluoroscopic examination showed spastic colon. She had been taking tincture of belladonna and alkaline powders. In March she was seen in the Protein Clinic for patches of eczema.

In the background we have a scary, canoe-like personality who as a little child had occasional outbursts of eczema under the strain of changing schools or speed tests. She has, also had one or two outbursts of asthma whenever passing through a period of worry occasioned by her erratic and alcoholic father.

Treatment. The condition was explained to the patient and family with resulting elimination of symptoms in three weeks and no subsequent return of her former invalidism.

Earl H. aged 32 a worker of the Bethlehem Steel Company was referred to our Psychiatric Dispensary, because one morning several weeks before he ran into the Accident Room of our Hospital in an attack of belching, palpitation, dyspnea and apprehensiveness.

The present illness began in September 1932. From that time until he came into our Accident Room he was under almost continuous treatment from a gastro-intestinal standpoint. All examinations were negative. He was tried on belladonna and diets and bromide and other nerve medicine every time this therapy failed he became even more panicky and upset than before. Within two weeks time his sick benefit would have expired.

In the background of the condition we find a man who had worked regularly for the Bethlehem Steel Company since twenty years of age. He is a skilled workman. Last June by reason of two cuts he was

unable to keep up payment on a home which he had been trying to buy during the last three years, and to which he and his family were much attached. All summer they looked for quarters and in the fall found a broken-down shack of a place which they were able to get for very little rent because the owner could do nothing else with it. A friend of the family who had always paid board until this time lost his job in September 1932 and Mr H felt that he should keep him. The patient did not complain of any of these circumstances that I have mentioned. His complaint was of his stomach and the palpitations. When asked in general about worries and cares he denied the same in a cheerful way saying "We all have our troubles and mine are no worse than anybody else's I guess. If I were feeling well I would not mind anything." This man was put directly back on his job being told that he would feel badly that he would have more attacks but if he would see it through he would not regret the effort it took to break up these nervous habits. He returned to work five days after his condition was explained to him and has not lost a day since then.

In summary then, anxiety attacks or anxiety neuroses are common and relatively benign nervous conditions that the practitioner can handle effectively if he is not too befogged by the complexities of psychoanalytic literature, and if he is willing to take a little time and interest in understanding the personality and situational background of his respective patients. The condition may, however, fall into chronic invalidism and a profound doctor habit status if treated along the mechanical lines of rest, drugs and specific intensive therapy directed against physiological systems that happen to be registering protests against emotional strains of which the patient may or may not be aware.

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THE TREATMENT OF PEPTIC ULCER COMPLICATED BY HYPERSECRETION

BY EDWARD S. EMERY, JR., M.D.*

THE object of this paper is to point out that there is a certain group of patients with ulcer, who are resistant to all our present means of therapy and may indeed be made worse if the more radical forms of treatment are used. It is now pretty generally recognized that ulcer is a chronic disease and that none of our present methods of treatment are curative. Furthermore, the study of a large number of patients with ulcer shows that the greater proportion can be kept comfortable and that the results of treatment by different methods are much

the same, provided the same type of case is treated.¹ Yet there has been a growing tendency to use more radical forms of surgery with the hope of curing a greater number of patients.

If the simpler forms of treatment do not prove satisfactory, it is natural to search for better results with more radical methods. However, radical treatment is contraindicated in certain patients of which the following cases are examples.

CASE I. A. F. medical No 29971 an Italian laborer of 30 years, first entered the hospital in April 1927. For two and a half years he had been having typical symptoms of ulcer.

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diagnostic clinics and dispensaries with equipment for electrocardiogram and chemical analysis. The diagnostic clinic and the dispensary do not wish to treat these patients. They are glad to study and attempt a diagnosis, and send these patients back to the practitioner to treat.

Having ruled out any so-called lesional pathology the next step is to convince the patient that these body protests of heart or gastro-intestinal tract represent emotional states, the nature and content of which it is the doctor's business to discover and interpret for his patient. One must remember that all of us are very suggestible as human beings, but the anxiety neurotic is especially suggestible. It does no good to tell such a palpitating individual that his heart is sound, and then give him a tonic or some other bottle of medicine, and tell him to go slowly, to rest as much as possible, or to take a trip somewhere. I have had these patients say again and again, "Yes, the doctor told me my heart was all right, but he gave me medicine and told me to rest, and I thought he was keeping something from me." The best educational process is sending such a patient right straight back to work, or to send him into crowds, or whatever else he is afraid of, telling him that he is quite likely to have other seizures, that he will feel wretchedly apprehensive, but if he will stick it out he will cure his fear, and he alone can do the trick. Years ago when we had horses and steam rollers the same sort of educational process worked in getting the horse over being afraid of this terrifying object in the road. One drove him close to it, let him shake and tremble and jump, and eventually he became so used to the engine that he did not even shy. Change of scene with its diversions merely postpones the day when the patient must return and face the situation which gave rise to his fears. Moreover, one must remember that he takes his personality and biology with him to Atlantic City or Europe.

The next step is to discover the factors of situation or domestic relations or vocational misfitting that have upset the patient's equilibrium. The physician who reads psychoanalytic literature is apt to go about this by looking for some very obscure and complex mental conflict. As a matter of fact the common factors lying behind anxiety states are relatively simple. It is almost useless to ask such a patient if anything is worrying him, for he usually gives a perfectly smooth story in the negative, not because he is secretive, but because he is honestly unaware of what is upsetting him. He may be aware of situations that are uncomfortable, but quite unaware that they are having any effect on him. It is up to us to take a little time to go into such commonplace matters as fear of losing a job, illness in the family, sudden deaths from stroke and heart disease, the losing of a

home through inability to meet building loan payments, an accumulation of small debts, crowded living conditions associated with having to bring indigent relatives into the family home. Having discovered these factors it is not enough to tell such a patient not to worry, and to exercise self-control. The facts revealed may make him feel ashamed that such matters could get a rise out of him. Right here it is very important to put him at ease with regard to the frequency with which similar irritations upset all of us. It is helpful to take a little time to explain to him that under situations of discomfort even you and I, his physicians, are conscious of our bodies protesting in palpitation, sweating, shortness of breath, nausea. This makes him accept his symptoms as natural biological processes that others have, and desensitizes him to scare, in a quiet matter of fact manner.

Having given the patient dramatic doses of reassurance with plausible explanations, the next step is to get hold of husband or wife or parents and explain matters to them. It is well to do this in the patient's presence so that he does not think that you are telling one thing to him and another to his family. Elicit the family's intelligent cooperation in treating the next anxiety attack in as casual a manner as possible. Prescribe emphatically that the next time the patient has an attack in movie, at home, or on the street car the family is to sit quietly, not yielding to the patient's demands for spirits of ammonia, opening of windows, fanning, rubbing of hands and feet, and all the many procedures, environment goes through in its own fear of the patient's apprehensiveness, that he or she is dying. Such activities merely graft another scare upon the one which the patient already has. If relatives are given these instructions in the patient's presence they have a chance to carry them out backed up by the doctor's recommendations, and the patient cannot accuse them of being cold and heartless. All these details may sound childish and a waste of time, but they are frequently necessary to produce the psychological reassurance that the patient needs to calm his panic. If the patient really wants to be well and is not using his attacks as a cudgel over the heads of the environment, and if the family will carry out their share of the treatment, the condition subsides with surprising rapidity. Of course, there are a certain number of patients who do not want to be well, and there are a certain number of patients in whom anxiety attacks are not psycho-neurotic manifestations but episodes that occur as part of, or prodromal features, of a major psychosis, such as the manic depressive and the schizophrenic, or dementia praecox group, or as part of a psychopathic personality picture. Of the 232 cases mentioned above, 65 per cent responded in a matter of weeks or a month or two to the treatment procedures I have outlined. The

rhea practically ceased and the surgeons were, therefore, loath to operate. He was discharged and continued in much the same condition until February, 1933, when he showed so much loss of strength that it seemed wise to try further surgery. At this operation the opening into the colon was closed and a subtotal gastrectomy was performed, only enough stomach being left to permit doing an anastomosis with the intestine. As the fistula had caused a constriction of the jejunum with a resulting dilatation of the proximal loop the jejunum was transected, the constriction removed and the distal cut end sutured to the stomach. The proximal end of the dilated portion was then closed and a lateral anastomosis made with the normal portion of the jejunum. The patient made a good recovery.

Eight days after the operation a gastric analysis showed a free acidity of 27 and a total acidity of 34. The patient was then in a convalescent home for six weeks and has done very well up to the present time.

CASE IV J W N, medical No 23383 a steel worker first entered the hospital in March, 1924 at the age of 42. The present illness began nine years previously with epigastric distress and vomiting two to three hours after eating. Physical examination was essentially negative. A gastric analysis showed 93 points of free hydrochloric acid and a total acidity of 110. The patient was anemic but the blood returned to normal during his ten days in the hospital. An x-ray examination showed that the cap was small definitely defective resembling somewhat the appearance of a pine tree and there was a definite tender point over the cap. This was regarded as indicating ulcer.

He was given six meals of bland food and some alkaline powders and was discharged improved. He later returned to the Out Patient Department for recurring epigastric discomfort and was readmitted to the wards in February 1932. Physical examination was again negative. The x-rays were unchanged. A gastric analysis gave a free acidity of 105 and a total acidity of 125. He was started on a Sippy régime on which he developed a marked alkalosis. As many of the staff felt that medical treatment had proved unsatisfactory he was transferred to the Surgical Service and a transection through the proximal part of the antrum was done and a gastro-jejunosomy performed after the lower stump was inverted according to the Billroth No 2 procedure. The patient made an uneventful recovery and was discharged from the hospital on March 15 1932 twenty-one days after the operation.

Shortly after discharge the patient developed mild gas pains and a week later had typical symptoms of ulcer. The pain rapidly became more severe and he was readmitted to the Medical Service on April 2. An x-ray examination revealed that the barium emptied rapidly and well through the posterior gastroenterostomy but there was a large crater about 2 cm distal to the stoma. Some of the barium filled the proximal loop which appeared dilated and there was a small six hour residue in the region of the duodenal cap where there was tenderness on palpation. A gastric analysis revealed 50 points of free acid and a total acidity of 80. The patient failed to obtain complete relief on medical treatment and was therefore transferred to the Surgical Service on April 23.

The old midline incision was reopened. The marginal ulcer at the anastomosis of the jejunum and stomach was adherent to the colon and an inflammatory reaction had already extended into the colonic wall. This was freed and after considerable difficulty the old posterior gastroenterostomy was unhitched. The ulcer bearing area was then excised and an end-to-end anastomosis made between

the jejunal ends thus freed. A subtotal gastrectomy was then performed leaving only about 4 cm of the upper end of the stomach, and a fresh loop of jejunum was anastomosed to the anterior wall of the remaining stomach. The entire procedure was beset with many technical difficulties and consumed four hours, but the patient left the operating room in fairly good condition. Twenty days after the operation a gastric analysis gave a free acidity of 12, a total acidity of 29. On the twenty-eighth day postoperative, he began to complain of pain deep in the epigastrium coming on late at night, and it was soon noted that it was relieved by food. A gastric analysis on the thirty-third day after the operation showed a free acidity of 56 and a total acidity of 66. He was started on a Sippy régime with a soft solid diet. This relieved his discomfort during the day and an occasional pain at night was relieved by milk. A gastric analysis forty days postoperative showed a free acidity of 35 and a total acidity of 43. An x-ray made forty-one days postoperative showed only 5 cm of the stomach remaining and a well functioning anastomosis. No evidence of ulcer could be seen.

On August 1 1932 approximately three months after his previous operation the patient was seized with a severe abdominal pain which doubled him up. He continued to be so uncomfortable that he was again readmitted to the medical wards on August 5. X-rays showed the barium to be emptying rapidly and well into both jejunal loops. There was a smooth projection between the two loops containing a small residue of barium at six hours. The efferent loop was dilated but showed increased peristalsis. The cecum was irregular at six hours. Impression was a postoperative stomach possibly a jejunal ulcer.

Further studies on the ward revealed the presence of a gastro-colic fistula. A gastric analysis at this time showed a free acidity of 78 and a total acidity of 93. The patient was again transferred to the Surgical Service where the fistula was excised and the ends of the intestine brought together. This operation proved too much and the patient died two days later.

There are certain factors common to all four cases. Each patient had a high gastric acidity. Although the original gastric analysis in Case I showed a free acidity of 45 a later analysis revealed an acidity of 101 after a gastroenterostomy had been performed, so that it seems probable that the original analysis was in error. Each case was treated by increasingly radical procedures. Each patient is worse today than when he was first seen.

In view of these results the effect which surgery had upon the gastric acidity becomes of interest. Removal of the antrum, such as was done in Case I and Case II did not lower the acidity and may have increased it. This frequently occurs following the operative procedures advocated by Polya and Billroth in his second operation. These operations not only fail to reduce the acidity but they remove a portion of the stomach which normally produces an alkaline secretion, therefore, they should theoretically do more harm than good.

In Cases III and IV a subtotal gastrectomy was accomplished. Only enough of the stomach was left to permit the suturing of the stomach

Physical examination was essentially negative, his weight at this time being 140. The x-rays showed a small, constantly deformed and flattened cap. There was no evidence of obstruction. A gastric analysis showed a free acidity of 45 and a total acidity of 65. Surgery was advised because it was thought that 'the patient's occupation and general mental attitude made it inadvisable to try medical treatment.' A Horsley pyloroplasty was done and, after a stormy convalescence, the patient was discharged from the hospital twenty days later.

Re-examination by the x-ray showed a hypertonic, somewhat dilated stomach with a six-hour residue estimated at fifteen per cent. Gastric outline was smooth except at the pyloric canal which was irregular and distorted. The barium emptied poorly through the narrow channel.

He was observed in the Out-Patient Department of another hospital until August, 1927 when he re-entered the Surgical Service of the Peter Bent Brigham Hospital. Three weeks before re-entry he began to experience dull persistent pain in the lower abdomen. A gastro-enterostomy was performed and an x-ray examination two weeks later showed the stoma to be functioning well.

However, the symptoms returned shortly after discharge and an x-ray done at the Boston Dispensary in the summer of 1929 showed the presence of a jejunal ulcer. Because the pain became severe he was readmitted to the Surgical Service of the Peter Bent Brigham Hospital in September, 1929. An x-ray at this time showed a narrowing and irregularity of the jejunum and a crater about $1\frac{1}{2}$ cm distal to the stoma. Another operation was performed by which the gastro-enterostomy was undone and one-third of the stomach was resected. A gastric analysis previous to this operation showed a free acidity of 101 and a total acidity of 110.

As the patient continued to have pain and did not gain in weight, he was readmitted to the Medical Service in October, 1931. An x-ray at this time showed that the gastro-enterostomy was functioning intermittently. Palpation under the fluoroscope showed two craters apparently in the stomach along the resected end just distal to the stoma. A gastric analysis showed a free acidity of 116 and a total acidity of 126. He was placed on a careful Sippy régime and remained in the hospital for three months. During this time he gained some strength and put on ten pounds in weight. However, his symptoms returned shortly after discharge. He is now unable to work and is worse today than when he was first seen in 1927.

CASE II B W medical No 31512, a Jewish upholsterer first entered the Medical Service in December, 1927 at the age of 28. He had been suffering for four years from epigastric distress after meals, relieved with food and soda. He had been given a dietary treatment for duodenal ulcer three years previously in the Michael Reese Hospital in Chicago. Physical examination at the time of entry was essentially negative. A gastric analysis showed a free acidity of 90 and a total acidity of 108. He was placed on a Sippy régime and after two weeks I made the following note: "The patient now shows a definite retention which will probably disappear to some extent on further treatment. However it seems up to the patient to decide whether he wants to take operation now or see if the retention will decrease on further treatment."

On January 2 the surgeons reported as follows: "The patient appears to have had two fair trials of medical treatment with many intervening months of partial treatment without result and surgery should be offered as a possible means of relief." At the time of operation the scar of a large ulcer was found in

the first portion of the duodenum, just distal to the pylorus. It could not be completely excised and the end of the duodenum was turned in and sutured. A posterior Polya operation was done, the free end of the stomach being pulled through the transverse mesocolon and joined to the jejunum by a lateral anastomosis.

The gastric symptoms recurred two weeks after discharge and he re-entered the Medical Service in August, 1928, because of a hemorrhage. He was discharged after a few weeks but continued to have pain and frequent hemorrhages. After four medical admissions for pain and bleeding, the patient was explored in April, 1929, and no cause for the bleeding was found. However, the symptoms continued in spite of all kinds of medical treatment, including mucin and x-ray therapy. The gastric acidity during these years ranged from 40 to 70. In June 1932 an x-ray examination revealed the presence of a jejunal ulcer and he was readmitted to the Surgical Service in August, 1932.

At operation, many adhesions had to be removed and so much difficulty was encountered that the whole stomach could not be sufficiently mobilized to attempt a true subtotal gastrectomy. Consequently, three-fourths of the stomach was removed making a direct anastomosis to a long loop of the jejunum. He was discharged twenty-three days after the operation and at this time a moderate amount of free hydrochloric acid was found to be present. Since then the gastric acidity has increased to its preoperative value. The symptoms have continued and the latest x-ray examination shows a possible gastric ulcer.

CASE III, P J M surgical No 17643 a machinist, first entered the Surgical Service in October, 1922 at the age of 32 for osteomyelitis. He also complained of epigastric distress coming two hours after meals and relieved with food and soda.

An x-ray showed a duodenal ulcer with hyperperistalsis. A gastric analysis revealed a free acidity of 80 and a total acidity of 90. The rest of the laboratory findings were negative. The surgeons performed a gastroenterostomy with a plication of the pylorus which gave complete relief for two years. Then a massive hemorrhage occurred for which he was admitted to the Medical Service in November, 1924. No gastric analysis was done at this time but he was put on a Sippy régime and aspirations showed a total acidity as high as 80.

Except for the chronic osteomyelitis of the leg, the patient remained well until December, 1928 at which time his gastric symptoms returned. An x-ray showed that the jejunum just distal to the stoma was narrow and irregular with a crater on the lateral aspect. He was started on a Sippy régime, shortly after which he developed diarrhea. This continued until he entered the Medical Service in October, 1929. X-rays revealed the presence of a gastrocolic fistula and he was transferred to the Surgical Service. Gastric analysis showed a free acidity of 60 and a total acidity of 92.

The old gastroenterostomy was demounted and the gastrocolic fistula closed. The patient was symptom free for five months and then began to experience a sense of fullness in the epigastrium, loss of appetite and belching of gas. This was followed by vomiting. He re-entered the Surgical Service in May, 1930 where it was found that he had developed a marked pyloric obstruction for which a gastroenterostomy was again performed.

Following this operation he was symptom free for seven months at which time he developed a painless diarrhea. This continued unchecked and in September, 1931 the x-ray revealed another gastrocolic fistula. Gastric analysis showed a free acidity of 60 and a total acidity of 90. On rest in bed the diar

tion of the juice, to receive the highly acid secretion. Once the obstruction is overcome, it is better to treat the patient medically even though some symptoms persist than to attempt complete relief through radical surgery.

SUMMARY AND CONCLUSIONS

Four cases of duodenal ulcer are reported which were operated upon because of a failure to obtain complete relief by medical measures. Owing to the development of jejunal ulcers in three and a tendency to bleed in one more radical procedures were attempted resulting finally in the removal of from three-fourths to seven eighths of the stomach. In no case has the condition of the patient been improved by this radical type of treatment.

The cases illustrate that there are a certain number of patients suffering from peptic ulcer which cannot be cured even by subtotal resection of the stomach and may, in fact, be made worse by it as these patients have been. Caution should, therefore, be used in deciding upon

this operation. It is suggested that where a jejunal ulcer develops with the simpler operation such as gastroenterostomy, it is wiser to undo the enterostomy than to attempt more radical surgery. It is also suggested that poor results are more likely to occur where a continuous night secretion exists.

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LEUCOCYTOSIS IN MENTAL DISEASE*

BY JACOB KASANIN, M.D.†

THE normal variation of the number of leucocytes in peripheral circulation is usually given between 5 000 and 10 000. Although this figure is still adhered to by most textbooks, a great deal of recent work has brought out some facts which will probably modify our idea of the limits of physiological variation of the number of leucocytes in blood.

Thus Sabin¹ as a result of an extensive review of literature and her own investigations stated that variation in the number of white cells in circulation may be over 100 per cent pointing out that "for each individual the highest number of cells in any day tends to be twice the lowest number." She postulated a certain rhythm of the white blood cells just as there is a rhythm of the temperature of the human body. Sabin pointed out that the variation in the number of cells was much greater than the accepted values. Subsequent work by other investigators has confirmed Sabin's conclusions.

Thus Medlar² studying 17 healthy adults came to the conclusion that a variation of 100 per cent in the total leucocyte count and 30 per cent in the differential may be found in an average healthy individual in the course of weeks without any clinical manifestations of disease. Christianna Smith³ made the same observation in a group of young, healthy students

in a girls' college. All observers agree that there is a rise in leucocyte count in the afternoon and that this rise is not necessarily due to digestion because the same rise takes place when no food is given at noon. These investigators also found that the counts went as high as 13 000 without any evidence of disease. The exact mechanism of this wide fluctuation in the white count was not understood until certain theories were advanced first by Sabin and subsequently by Garrey.⁴

In an explanation of this wide variation Sabin used a very graphic description of "showers" of cells being discharged into the peripheral circulation at definite intervals approximating an hour, thus imparting the idea of a certain rhythm in the discharge of the leucocytes. On the other hand, Garrey maintains that the leucocyte count remains very stable in the same individual as long as that individual is in a state of absolute rest. This he calls a "basal band", and he finds that under the condition of absolute rest the count varies between 5 000 and 6 000. On the other hand when the individual is normally active the count varies between 8 000 and 10 000, and 10 per cent show even a higher level. This is called by Garrey "the count at activity level." The same investigator believes that the high white counts are due to the fact that the patients have been more active than usual and in confirmation of this theory he brings up a large number of interesting observations. Thus a mild degree of exercise induced

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to the small intestine, yet, within a few weeks of the operation the acidity in both cases was as high as before the operation was performed. This agrees with Fauley's² finding that the stomach tends to hypertrophy after operations of this kind. If these radical operations do not effect a very decided decrease in gastric acidity, there is little reason to expect a cure, for the recent laboratory studies³ strongly suggest that ulcers are dependent upon the damaging effect of the hydrochloric acid.

In looking back at the history of these four cases, it becomes evident that they would have been better off if medical treatment had been persisted in. Although the results with medicine would not be classified as satisfactory, yet the patients would be no worse today than at the time treatment was started. All four of these patients were engaged in active work when under medical treatment, today, one of them is dead, one has worked only at intervals during the last five years, one has not worked for four years and one has not worked for six years. It, therefore, becomes important to know when operations of this kind may be used with safety.

For a number of years I have felt that a patient showing a high gastric acidity and evidences of nervous instability was prone to develop jejunal ulcers after gastroenterostomy and have argued against its use in this type of case. Jejunal ulcers have always proved to be serious complications in our hands. Excision of the ulcer has been followed by the development of another if the enterostomy has been allowed to remain. Healing or controlling by medical means has proved more difficult than treatment of the original ulcer. For these reasons and because of the satisfactory results reported by others⁴ with subtotal gastrectomies, the removal of most of the stomach seemed indicated in those cases which developed jejunal ulcers. However, our results show that this radical procedure cannot be relied upon to cure these unfortunate persons.

I have concluded, therefore, that when a patient develops a jejunal ulcer following a gastroenterostomy, an attempt should be made to heal it by medical means. If this proves unsatisfactory, the best form of treatment consists in undoing the gastroenterostomy and treating the patient by good medical therapy. It is better to subject the patient to a continuously stringent régime than to run the risk of disabling him with surgery.

As already stated, a certain group of patients with a high acidity and certain nervous characteristics are prone to develop jejunal ulcers. These patients are usually thin, flush easily, have moist palms and respond poorly to alkaline therapy. They frequently develop alkalosis on a Sippy régime and respond to alkalies by an

increased flow of gastric juice. The failure of these patients to do well is not entirely dependent upon the high acidity, as the results of a large series of patients are much the same irrespective of the gastric acidity (See table I). Some other factor must come into play. A

TABLE I
NUMBER OF SATISFACTORY RESULTS VERSUS
THE GASTRIC ACIDITY

Free Acid cc. n/10 per 100 cc	No Sat Results	Total No Patients Treated	% Sat. Results
0-20	64	85	75.2
21-40	134	204	65.6
41-60	197	254	77.5
61-80	125	162	77.1
81 plus	89	117	76.0

high acidity may be due to a failure of normal neutralization or to such an overproduction of gastric juice that the normal mechanism of neutralization is inadequate.

It is the latter type of case which is more difficult to treat medically and which shows a greater tendency to develop jejunal ulcers. This type is also prone to secrete acid long after the stimulus, in the nature of food, has disappeared. Early in the use of his method of treatment, Sippy recognized the importance of a continued secretion at night as a serious complicating factor in the way of therapy. Failure to recognize and check this continuous secretion is the most common reason for poor results with this treatment. Recently, Henning and Norpoth⁵ have shown that this continuous night secretion does not occur in healthy persons. This is a complication of ulcers to which too little attention has been paid. It can be easily demonstrated that control of the acidity throughout the day is not sufficient for healing if a continuous secretion occurs at night. If an operation is performed where this condition is present, and the mucous membrane of the jejunum is forced to come into contact with the gastric acidity daily from 18 to 24 hours, it is unlikely that the resistance of the membrane will be sufficient to prevent the development of an ulcer. Therefore one should not advocate surgery in the presence of a continuous secretion. The presence or absence of a night secretion can be easily determined by passing a Levine tube through the nose and allowing it to remain in the stomach throughout the evening and night if necessary. Fortunately, the complication of a hypersecretion with obstruction is rather uncommon but if the two are present and surgery is required because of the obstruction, a pyloroplasty according to the Finney or Horsley type should be preferred. These two operations allow the mucous membrane of the duodenum, which is best suited to resist the corrosive ac

One of the tables, however (table II), suggested that there was a possible correlation between the leucocytosis and the amount of activity of the patients on the ward. In this table we can see that 58 patients who were either restless, overactive, or variable showed a white count of over 15,000, whereas 65 patients who were quiet, underactive, or stuporous showed a white count below 10,000.

The number of variables in mental patients is

cases and as a result of his study he became convinced that there must be some toxic or infectious factor in at least one-half of the cases of chronic mental illness, but physical and laboratory examinations in our cases did not substantiate that evidence. It is rather interesting that the white count shows more of the emergency reaction in mental cases than does the blood sugar. Thus in a large group of mental cases which I have studied with Dr. Bowman⁸,

TABLE II
THE WHITE BLOOD COUNT AND STATE OF ACTIVITY IN 200 CASES OF MENTAL DISEASES

	Stuporous	Under active	Quiet	Restless	Over-active	Variable	Total
W B C 15,000 or above	5	13	24	31	24	3	100
W B C below 10,000	1	10	54	21	14	0	100
Total	6	23	78	52	38	3	200
Remarks	Includes semi stuporous		Includes normal and fairly quiet	Includes active	Includes excited, violent and tense	Over active and under active	

so great that it is impossible to study just one variable, but it is important to remember that these blood counts were done on patients who were in the hospital less than a day and who came there in the acute stage of their illness when they were still excited, upset, tense, unhappy, and very frequently distraught overactive, and excited. This condition certainly existed in more than 50 per cent of the cases, and it is not surprising that we find blood counts of over 10,000 in a similar proportion of cases, which goes well with the recent work on the influence of emotional states and muscular exertion on the white blood count. The only table which was at all suggestive of a possible clue to the high white count was the one on activity of the patients in the hospital. Of course the question can be raised as to whether all these patients were not suffering from some physical disease, and the psychiatrist is usually accused of being woefully ignorant of the possible somatic and toxic factors which might be the cause of these psychoses. There is no evidence, however, that the patients with the high white count showed a great deal more illness than those that had the count below 10,000. Both groups stayed in the hospital the usual period of time and then went on to other hospitals without showing much significant difference between the two groups.

This paper is not an attempt to prove that a high white blood count does not mean anything in mental disease, it merely calls attention to the psychomotor state of the patient as a possible factor in the causation of the leucocytosis when all other factors have been eliminated and have been found to be negative. The Schilling index and the nuclear index were studied in great detail by Fleming⁹ in a large series of

we found no evidence that the blood sugar was any higher in emotional states in mental patients than it was in states of rest. It is interesting to note that when one compares the figures in an acute mental hospital with those in a chronic mental hospital, we find that in the latter the white blood counts do not tend to run so high, as I intend to show in a later communication. It is of note that in most cases showing leucocytosis of unknown origin the count tends to drop within a few days after the patient's admission to the hospital, as they get acclimated to the new environment and as they themselves quiet down to a more basal level of their activity.

CONCLUSIONS

1 In a sample of 1,553 unselected cases of mental disease more than 50 per cent of the cases showed a white count of over 10,000 cells, and 14 per cent in the same group showed a leucocytosis of over 15,000 cells.

2 A group of 100 consecutive unselected cases with normal white counts (below 10,000) was compared with a similar group of 100 cases showing a definite leucocytosis (above 15,000). The two groups were compared with reference to sex, age, various physical factors, temperature, mood, diagnosis, and the amount of activity on the wards.

3 There were no significant statistical differences between the two groups. There was a possible suggestion, however, that overactivity was associated with the high white counts, while underactivity was associated with normal white counts.

4 It is suggested that in the absence of definite infection, toxicity, and other somatic fac-

by a few knee bends may raise the leucocyte count to 12,000 or 13,000. A 100-yard dash raises a count from the normal activity level of 8,000 to 22,000 within 15 seconds. A subsequent 440-yard dash raised the count to 26,000. A competitive quarter-mile race caused a rise to 35,000. After a 45-minutes' rest the count came down to 30,000. A 5-minute oral quiz raised the count from 5,000 to 9,000 and 10,000. Garrey especially emphasizes the importance of nervous and psychic factors. Thus a sudden surprise by stimulation of the skin causes a rise in the count of 2,000 cells. When a hyperthyroid patient was told that he would have to be operated on, he showed a rise in his count from 7,000 to 18,000. In highly nervous cases the mere suggestion of blood-taking is sufficient to raise the count very promptly and significantly and might suggest a possible pathological leucocytosis. In his own laboratory Garrey⁵ is extremely careful to reduce to a minimum the emotional stimulation in determining the basal count; thus the patient remains in bed and an especially sharp cataract knife is used so as not to cause any pain when puncturing the finger for the drop of blood. The pain of angina pectoris, in Garrey's observation, caused a leucocyte count of 18,000 although the basal level of the same individual was approximately 7,000.

In the field of mental diseases it was observed for a long time that many patients have shown high white counts and this was never explained except on the basis of possible infection, which, however, could not be demonstrated. The first large series of cases showing that there is a definite increase in the number of white cells in mental patients was done by Bowman⁶, who in a series of 1,657 patients showed that in 50 per cent of these cases the white count was over 10,000 cells. Thus in 789 cases of schizophrenia 54 per cent of the cases had a white count above 10,000, 18 per cent of the cases had a count above 12,000, and 11 per cent of the cases had a count above 15,000. The same proportion held true for the cases of the manic-depressive type. In a group of 587 cases of affective disorder 53 per cent of the cases had a white count above 10,000, 21 per cent had a white count above 12,000, and 12 per cent of the cases had a white count above 15,000. In the 281 cases of general paralysis the proportions were slightly lower.

These extraordinary findings by Bowman attracted my attention. In an attempt to find a possible explanation for the high white count in so many cases, I took the figures obtained for all the new admissions to the Boston Psychopathic Hospital in 1927. During that period 1,553 patients were admitted and counts were made in all but 46 cases. Most of the counts were made in the afternoon by several technicians whose jobs consisted in doing the routine laboratory work of the hospital. In this series (See table

I), only 45 per cent had a white count below 10,000, whereas 52 per cent of the cases had a white count over 10,000, and of these 18 per cent had a count between 12,000 and 15,000, 10 per cent had a count of 15,000 to 20,000, and 4 per cent of the cases had a white blood count of over 20,000. In order to find out the possible significance of these high white counts I took 100 cases who had a white blood count above

TABLE I
LEUCOCYTE COUNT

General Distribution in 1553 Cases, All Diagnoses, Male and Female, Admitted to the Boston Psychopathic Hospital in 1927.

White Count	Number of Cases	Per Cent
Under 5,000	14	1
5,000 9,999	682	44
10,000 11,999	316	20
12,000 14,999	280	18
15,000 19,999	158	10
20,000	57	4
Unknown	46	3
Total Number of Cases	1 553	100

15,000 and compared them with 100 consecutive cases which had a white count below 10,000. Statistical tables were made showing the comparative figures of these two groups of cases in reference to positive physical findings, temperature, mood, activity, clinical diagnosis, sex, and age. I might say that most of these white counts were done within a few hours after the admission of the patients to the hospital and always within the first 24 hours after their admission. They were usually taken in the afternoon, either before, during, or after supper. A review of the various tables showed that in respect to physical findings the cases with a leucocyte count above 15,000 showed more evidence of infections, metabolic disorders, and also various conditions such as pregnancy, lactation, and puerperium. There were more cases below 10,000 which showed negative conditions, healing surgical wounds, or mild neurological signs such as unequal reflexes, facial asymmetry, and so forth. There were more cases with a rectal temperature above 100° in the group which had a white count above 15,000. Going over the mood of the patients I found that patients who were depressed, stuporous or elated, and whose mood was otherwise variable, showed more cases with a white count above 15,000, whereas the patients who were either apathetic, normal, or somewhat tense tended to have the white count below 10,000. The tables for age and sex did not show anything significant statistically. In the table showing distribution of cases by diagnosis there was a slight suggestion that cases showing the affective disorders had more frequently a count of over 15,000. All the above findings which I discussed were more suggestive than conclusive.

born their only children Ann Louisa on June 21 1834 and Tilton Clark on July 7, 1839

About 1842 Robert Hall became a lay assistant to Dr. Lemuel W. Paige (1807-1857) of the neighboring town of South Weare. The Hall family moved to that town where they resided for several years, returning to Concord before 1847. This physician, besides having an extensive practice, was engaged in the manufacture of certain favorite prescriptions, chiefly of an herbal nature, which were sold both through druggists and also along the countryside of northern New Hampshire and Vermont. Robert Hall from boyhood had been interested in botany so that this occupation was to his taste. In 1847 he is designated as an apothecary in Concord.

Although Mrs. Hall's maternal uncle (Dr. Thomas Carter) was a physician, having attended the Dartmouth Medical School in 1813, there is no record that up to the time of going to South Weare, Mrs. Hall had any idea of studying medicine.

At South Weare she was given the privileges of Dr. Paige's library. The reading of his medical books aroused in her a keen desire to become a physician and under Dr. Paige's direction she pursued an orderly course of medical reading. However, there was no avenue by which she could attain her ambition to take a course in a medical school for there then was no institution where women could study medicine. This was at least two years before Elizabeth Blackwell was admitted to the Medical Institution of Geneva College and before Harriet K. Hunt applied for admission to Harvard Medical School.

However a partial solution was about to develop. In 1845 Dr. Samuel Gregory of Boston began to agitate the question of medical education for women. He published two pamphlets arguing that trained women physicians should be available to treat the diseases of women. He was especially opposed to obstetrical practice by men, or what both in Great Britain and the United States, were termed "men midwives." As a result of Dr. Gregory's efforts in October 1848 was organized in Boston the Female Medical Education Society, which sponsored a course of instruction in midwifery which they called the Boston Female Medical College. This society had no charter at the outset. It could grant no degrees, but after the successful completion of one, or usually two twelve-week terms of instruction the society issued a certificate of proficiency in midwifery.

The staff of the "college" consisted of three men. Dr. Gregory was administrative secretary, but gave no instruction. Dr. William Mason Cornell (A.B. 1827 Brown M.D. 1844 Berkshire) who was both Baptist clergyman and physician, gave some instruction in materia medica

and elementary medicine. The major part of the teaching was by Enoch Carter Rolfe (M.D. 1838 Bowdoin) who taught anatomy, physiology, and midwifery. His share was so great that the institution was frequently called Dr. Rolfe's school. Both Dr. Cornell and Dr. Rolfe were in good standing in the profession and Fellows of the Massachusetts Medical Society.

The first course began November 1 1848 with a class of twelve women of whom Mrs. Lucinda Hall was one. Mrs. Hall, during this course lived at the home of a physician of East Boston who was a relative. Due to her previous study under Dr. Paige she was able to attain the certificate of proficiency at the end of the first course and was a member of the first small class of "graduates" of this "college" consisting probably of four women. She was at this time thirty-three years of age and her youngest child was nine years old. Mrs. Hall returned to Concord N. H. where she practiced midwifery. For several years she was the only woman in New Hampshire holding the certificate of this institution.

However, this attainment did not satisfy her ambition. She had received no instruction in surgery in the course at Boston and little in medicine, and her desire was to take a full medical course and attain a degree in medicine. At this point enters the physician of East Boston in whose family she had lived in 1848.

In 1850 the Central Medical College of Rochester N. Y. had instituted a female department. This was an eclectic school. In Worcester Mass. was another eclectic medical school organized in 1846 and recipient in 1849, of a Massachusetts charter. Late in 1850 Calvin Newton, the dean of the Worcester Medical Institution wrote that he had been solicited to establish a female department, but no decision had been reached. The physician in East Boston repeatedly urged upon Dr. Newton that Mrs. Hall be admitted to the medical school and in March, 1852 three women were admitted to the Worcester Medical Institution. One of these three was Mrs. Lucinda Hall.

The requirement for graduation in this school was the conventional three years of medical study and attendance on two courses of medical lectures. It is evident that Mrs. Hall's study under Dr. Paige was accepted as a year of medical study and also that her course of instruction at the Boston Female Medical College was accepted as one course of medical lectures, since she attended but one course at Worcester that extending from early March to late June 1852.

That she was in Worcester previous to the opening of the course is shown by her advertisement in the Worcester Sp. of February 7 1852 soliciting midwifery cases and stating that she could exhibit the certificate of proficiency issued by the Boston Female Medical College. Her

tors the psychomotor state of the patients characterized by restlessness, tension, and overactivity may be responsible for the high white counts in such cases

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DR. LUCINDA SUSANNAH (CAPEN) HALL

The First Woman to Receive a Medical Degree From a
New England Institution

BY FREDERICK C. WAITE, PH.D.*

THE first woman to receive a medical degree in the United States had no contact with New England. Dr. Elizabeth Blackwell was born in England in 1821, lived in New York and New Jersey from 1832 to 1838, in Cincinnati from 1838 to 1844, taught school in Kentucky and South Carolina, attended two courses at the Medical Institution of Geneva (N. Y.) College and graduated there January 23, 1849. She practiced in New York City from 1850 to 1869 and thereafter in London, England until her death in 1910.

In 1850 at Central Medical College of Rochester, N. Y. one woman was graduated. She was born in Massachusetts, but was not a resident of New England after 1844.

In February, 1851, at the same institution two women were graduated, one of whom was a native of Vermont, but a resident of New York after 1844. On March 6, 1851 two women were graduated at the Syracuse (N. Y.) Medical College, neither of whom had any relation to New England. In the closing days of 1851 the Female Medical College of Philadelphia graduated its first class. Of the eight women members one (Dr. Martha A. Sawin) was a native and resident of New England and returned to Boston to practice.

In February and March 1852 two medical schools at Cleveland, Ohio graduated each one woman. One of these (Dr. Nancy E. Clark) was a native and resident of New England and returned to Boston to practice.

On February 19, 1852 the Central Medical College graduated three women, one of whom (Dr. Parmelia R. Bronson) was a native and resident of Connecticut and returned to that state to practice. On May 27, 1852 one woman was graduated at the same institution. She was a native of England and for a time a resident of Massachusetts, but not after 1845. Diligent

search has failed to disclose the names of the graduates in 1852 at Syracuse Medical College so that no statement can be made as to the number of women, if any, graduated there in that year.

Before June, 1852, twenty women had been graduated in medicine by six medical schools, namely Geneva, Central, Syracuse, Female Medical of Philadelphia, Western Homeopathic, and Western Reserve. Five of these women were natives of New England. Of these five natives three returned to New England to practice.

This sketch concerns a woman who was born in New England, spent all her life there, graduated from a medical school in New England, and practiced there for thirty-eight years. She was the first woman physician who in all three factors of birth, residence, and medical education was completely a New England product.

Lucinda Susannah Capen was born July 13, 1815, on a farm near Stewartstown, Coos County, N. H., a small hamlet among the hills in the extreme northwestern part of the state. She was the fifth child and third daughter of Ebenezer and Abigail (Carter) Capen, who, following their marriage in 1805, had gone from Concord, N. H. to Stewartstown in 1806. When she was about ten years old the family returned to Concord. Here she received a common school education.

At the age of eighteen on June 4, 1833 she was married by Rev. Nathaniel Bouton, long the pastor of the North Congregational Church of Concord, of which Miss Capen was a member, to Robert Hall, five years her senior and native on a neighboring farm. He was the son of Captain James and Ruth (Abbott) Hall, a daughter of Benjamin Abbott who was in the battle of Bunker Hill.

Mr. and Mrs. Robert Hall resided first at Loudon, N. H., a few miles east of Concord, for about two years, and then returned to Concord where they lived seven years. In Concord were

*Waite Frederick C.—Professor of Histology and Embryology Western Reserve University. For record and address of author see "This Week a Issue" page 656

After retiring from the sanitarium in 1876, because of frail health, she restricted her practice to former patients and old friends. She continued this limited practice until a few days before her death which occurred at Birchdale, Concord, N H, on August 27, 1890, at an age past seventy-five years. The immediate cause of her death was cerebral hemorrhage, a first onset being followed in ten days by a second. She is buried in the Millville Cemetery three miles west of the statehouse in Concord.

From newspaper notices at the time of her death one learns of the high regard in which she was held in the community, both professionally and personally. From other sources it is learned that she was always enthusiastic about her profession and in return her clientele were grateful for her professional service. Her initiative, from which developed her eager desire to become a physician, sustained her through the difficulties which in those days impeded the path of a woman who wished to enter the profession. Having once entered practice her enthusiasm, industry, ability, and personality carried her on in successful medical service in spite of family sorrows and frail health. Her career is a fitting one for the pioneer of those many New England women who have entered the medical profession since Dr Lucinda Hall received her degree nearly eighty-two years ago.

Dr Robert Hall was interested in public service as well as in his profession. He held several minor appointive and elective public offices and in 1867 and again in 1868 was a member of the New Hampshire legislature. He died of cancer at Concord, N H on January 10, 1902 at an age past ninety-one years. Extensive newspaper notices at the time show that he had the respect and confidence of the community both for his professional and his public services.

The entries in medical school catalogues, show that many, possibly a majority of the early women medical students, were married when they entered medical school. One finds many cases where the wife of a physician followed him into the profession and practiced with him, but this is the only case that the author has found where the order is reversed and the wife graduated first to be followed into the profession by her husband.

This sketch of professional and domestic episodes in the life of a member of the first class of the Boston Female Medical College, who was also the first woman to receive a medical degree from a New England institution serves to show to the present-day medical student that great difficulties may be successfully overcome when initiative, perseverance and energy are applied to their solution.

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pale, cold and covered with perspiration. He was anxious and restless. The extremities were cold and deeply cyanotic. The skin on his body was purple and blotched. The veins of the neck were moderately distended. The heart was enlarged to the left and right. The apex impulse was diffuse and feeble. The sounds were of fair quality. There was marked gallop rhythm, rate 120. No murmurs were heard. The blood pressure was not obtained. The posterior chest was not examined. Anteriorly no râles could be heard. The breath sounds were loud. The abdomen was full and tympanitic. The liver edge was not definitely felt but there was resistance and dullness in the right upper quadrant three to four fingerbreadths below the costal margin. Rectal examination was not done. There was no edema.

Examination of the blood showed a red cell count of 5,400,000, a hemoglobin of 90 per cent, a white cell count of 28,500 with 83 per cent polymorphonuclears. One stool showed a two plus guaiac.

He was given a quarter gram of morphia on arrival and a venesection of 300 cubic centimeters was done. The breathing improved almost immediately and the pulse soon became stronger. He failed very rapidly, however, and died on the second day following admission.

DIFFERENTIAL DIAGNOSIS

DR PAUL D. WHITE: This case is one of much interest and difficulty. There are a few points in the history and examination on which I wish to comment.

In the first place he is a man of forty, just at the age when given heart disease we have a number of etiological possibilities. There are two chief problems in diagnosis, first, the kind of heart disease and its structural defects and secondly, the terminal events associated with his severe abdominal pain.

His cardiovascular history begins at thirty-five. He had moderate palpitation on exertion. That most probably is effort syndrome, whether associated with heart disease or not we cannot say.

At the age of thirty-eight he began to have what should be interpreted as angina pectoris. That is two years before he died or fifteen months before his first hospital admission. These attacks were relieved by nitroglycerin. This was followed by presumable heart failure, beginning on the left side with dyspnea, and then going on to ankle edema and other indications of failure of the right heart.

The past history does not help us. There is no history of rheumatic fever, tonsillitis, chorea or syphilis.

There was visible pulsation in the radial and temporal arteries. Such increased pulsation is usually associated with hypertension or with aortic valve disease and aortic regurgitation. There was no venous engorgement, but at that

particular time there was no evidence of congestive failure so far as the right ventricle was concerned. The heart was markedly enlarged to the left so that some factor must have been present at that time causing marked cardiac enlargement, such a factor could have been either mitral valve disease or coronary thrombosis. Angina pectoris with coronary disease does not give cardiac enlargement. Angina pectoris is frequently associated with a heart of ordinary size. We are not told whether the thrill at the base was systolic. It would be interesting to know what the findings were on physical examination at the time of discharge. Is there a note as to whether a thrill was palpated at the base?

DR AUGUSTUS S. ROSE: Yes, sir. There was a thrill at the base at the time of discharge thought to be systolic. Shortly after his admission the first time a definite diastolic murmur was heard at the base, interpreted by several observers as being a presystolic rumble, in addition to the other murmurs described.

DR WHITE: These findings are of great importance. Prodiastolic gallop rhythm at the time he came in first, when he showed congestive failure may be interpreted in a number of ways. The usual cause is dilatation of the left ventricle.

There is a statement that the diastolic murmur was heard along the left border of the sternum, indicating aortic regurgitation.

The blood pressure was normal, the pulse pressure, 60 with a systolic of 120 was less than one would expect and yet not indicative of any high degree of aortic regurgitation.

There was no note of examination for penile sear?

DR ROSE: It was looked for and not found. The Hinton test was negative.

DR WHITE: The electrocardiogram one would like to see oneself, to determine how much bundle branch block there was. The degree is important. If there is a high degree one must consider that the coronary circulation probably had failed and that coronary thrombosis is likely, if only a slight degree, it may be associated with other than coronary disease. The P wave in Lead I is very important as evidence of mitral disease. If there is a well-marked P₁ wave and it is notched it generally means mitral stenosis.

The x-ray shows more indication of left ventricular enlargement than of right probably because of the failure to find the characteristic prominence in the region of the pulmonary artery associated with mitral disease in contrast with an aortic valve lesion.

DR TRACY B. MALLORY: Have you anything to add to that, Dr. Holmes?

DR GEORGE W. HOLMES: No.

DR WHITE: The aorta was of normal size, that is substantiated by the evidence you see.

CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F M PAINTER, A.B., ASSISTANT EDITOR

CASE 20121

PRESENTATION OF CASE

First admission A forty year old American paper mill worker entered complaining of shortness of breath of six weeks' duration

Five years before admission the patient noticed moderate palpitation on exertion. Fifteen months before admission while working he had a choking, nauseated feeling with pain over the epigastrium. He stopped working for a few minutes until the attack was over and then continued. Since then he had had frequent similar attacks, usually occurring at night but frequently while sitting in the evening or while working about the house. The common characteristics of these attacks were apparently a choking sensation and pain in or just over the epigastrium. With the attacks there was usually nausea. The attacks varied in frequency, sometimes occurring every day for a week and at other times occurring about once every one or two weeks. Sodium bicarbonate gave some relief occasionally.

He visited the Outpatient Department of this hospital ten weeks before admission to the wards. He was given glyceryl nitrate, which gave him marked relief. He gradually became progressively dyspneic even on the slightest exertion, developed a dry cough, and recently had become definitely orthopneic. Six days before admission his condition became worse and edema of his ankles appeared.

His family and past histories are irrelevant. There is no history of rheumatic fever, tonsillitis, chorea, or syphilis.

Physical examination showed a well developed and fairly well nourished man propped up in bed, anxious, restless, sweating, and coughing frequently. His mucous membranes were slightly pale. There was no cyanosis. There was visible pulsation of the radial and temporal arteries. There was no venous engorgement. The heart was markedly enlarged to the left. The apex impulse was in the sixth interspace outside the nipple line. There was a very questionable thrill over the base. The sounds were of poor quality. There was a distinct third sound heard at the apex and to the left of the sternum, giving a protodiastolic gallop, rate 104°. A systolic non-transmissible murmur was heard at the apex and a systolic

at the aortic area, not transmitted to the vessels of the neck. There was a short blowing diastolic murmur heard best in the third left interspace at the edge of the sternum. There were frequent extrasystoles. No apical diastolic murmur was heard. The radial arteries were palpable. The pulse was collapsible. The blood pressure was 120/60 in both arms. There were many medium moist râles up to the mid scapular region on both sides. The respirations were 35. The liver dullness was down to three or four fingerbreadths. There was a moderate amount of edema of the legs and sacrum. There was no clubbing of the fingers.

Examination of the urine showed a specific gravity of 1.022 and a trace of albumin. The blood showed a red cell count of 4,500,000, a hemoglobin of 95 per cent, a white cell count of 6,600 with 74 per cent polymorphonuclears. The stools were negative. The non protein nitrogen was 32 milligrams. A Hinton test was negative.

An electrocardiogram showed premature ventricular beats interrupting the normal rhythm at a rate of 80 to 85. There was bundle branch block with left axis deviation. The P R interval was 0.21. P₁ was notched.

X-ray examination showed a considerably enlarged heart. The transverse diameter measured 17 centimeters, 5 on the right and 12 on the left. The transverse diameter of the chest was 29 centimeters. The oblique view demonstrated obliteration of the posterior mediastinum by enlargement of the left and right auricles. There was also prominence in the region of both ventricles. The aorta appeared to be of normal size. The lung fields were clear. The left costophrenic angle was shallow. The hilus shadows were prominent on both sides.

The patient remained in the ward for seven teen days and was discharged improved.

History of interval He remained at home following his discharge, spent most of his time in bed and felt quite comfortable, with very little breathlessness. The afternoon of his re admission he suddenly began to have severe abdominal cramps which caused him to double up and cry out. There was no diarrhea or vomiting. He ate supper thinking it might relieve the pain. It became much worse, however. He was frightened, and shortly after the onset of the cramps became markedly dyspneic, broke out into a cold, profuse sweat and, according to his friends, became extremely pale. This abdominal pain continued until his admission to the Emergency Ward at about ten o'clock that night. He had no precordial pain or cough. He had no edema during the interval and only slight orthopnea.

Second admission, two weeks after his previous discharge.

Physical examination showed a man propped upright in bed in acute respiratory distress and complaining of abdominal pain. His face was

PATHOLOGIC DISCUSSION

DR. MALLORY I am afraid that in this case I am not going to be able to answer a good many questions.

He had a greatly enlarged heart, weighing 750 grams, and the aortic valve showed an inter-adherence of two cusps with some degree of fibrous thickening of the edges pretty typical of a healed inactive rheumatic aortic involvement, not of great severity however. It seemed as though that alone in no way accounted for the very large size of the heart. The mitral valve was entirely negative, a point which is distinctly against rheumatic etiology. The aorta was negative, so I think we can safely rule out atherosclerosis.

There was a large area of infarction in the left ventricle on the posterior wall involving part of the interventricular septum. The central portion of this infarct was somewhat thin and fibrous, the peripheral portions gray and soft.

The coronary arteries showed perfectly normal orifices. It did not seem as though the valve involvement could have affected them in any way. There was definite sclerosis throughout all branches of both coronary arteries but no thrombosis could be made out anywhere.

As is quite frequently the case in these very large hearts we failed to find a coronary thrombus in association with the infarct. In a heart of nearly normal size I think we have never failed to find a thrombus if we examined it carefully.

DR. WHITE How old was the infarct?

DR. MALLORY I should say it was a matter of months.

We were limited in our examination by restrictions and could not make a complete examination of the abdomen. We simply went in through a hole made in the diaphragm. We were able however to examine the whole intestine externally and it was not discolored at any point, so I do not believe he had a mesenteric thrombosis. What his terminal bleeding in the gastro intestinal tract was I cannot explain. I have never seen mesenteric thrombosis in which gross discoloration of the serosa of the small intestine was not present.

A SURGEON Was there any free fluid in the abdomen?

DR. MALLORY No, the surfaces were smooth and glistening throughout.

DR. HOLMES Was there anything in the lung?

DR. MALLORY No, it was negative except for chronic passive congestion.

DR. WHITE I should like to ask about the attack of pain. Was it in the lower abdomen?

DR. ROSE He described it as being chiefly in the lower abdomen, but it was generalized and

we could not be definitely sure. I think it is fair to say he had abdominal pain, but I think it is better to say it was generalized with some in the lower abdomen. It certainly was colicky in nature, because as he was in bed in the ward he would suddenly cry out.

DR. WHITE This is certainly a very unusual combination of valvular disease and coronary disease. It is something we almost never see in young patients. We rarely get coronary thrombosis under forty but we must remember that it does occur, we have encountered about 15 cases in the past decade. In this case we doubtless should have paid more attention to the severe angina pectoris and to the bundle branch block by electrocardiogram.

DR. MALLORY It is interesting to note that in the last case with twenty-five years of hypertension the heart was normal in size. In this case with a minimal aortic valve lesion although a definite one and no hypertension we have a heart weighing 750 grams.

DR. WHITE Was the infarct a large one?

DR. MALLORY It was of fairly good size, 4 centimeters in diameter.

DR. WHITE We were once taught that coronary disease does not give rise to enlargement of the heart but now we know differently for some of the largest hearts we have seen have developed after coronary thrombosis. There is no doubt about the reaction of the heart to a large myocardial infarct with considerable increase in heart weight. Here, however, we have a complication with another condition, namely aortic stenosis and regurgitation.

LATER NOTE BY DR. WHITE On reviewing the history at its source I find clearer clinical evidence for the earlier coronary involvement. The very first severe attack of substernal and precordial pain a year or so before death is said to have lasted an hour or more. This tends to rule out ordinary angina pectoris in favor of actual coronary blocking (occlusion).

CASE 20122

PRESENTATION OF CASE

First admission An American housewife twenty-nine years old entered the hospital for the first time with a history of slight vaginal bleeding of three days' duration.

The patient was first seen eleven weeks before entry. She gave a history of having been married eight weeks earlier and having had no regular periods since that time. At this visit she complained of unusual bleeding and nausea and vomiting. The bleeding began twenty-four days before the visit and continued until six days before it at which time it increased in severity and amount, but was not really profuse. The history appeared to be consistent with a very

there The lung hilus shadow was prominent on both sides, this is of some importance

Finally this man had severe abdominal pain which was followed by death, and was attended by evidence of increased heart failure The blood pressure was not obtained and murmurs which might have been evidence of a heart functioning well had disappeared

The differential diagnosis must rest primarily between two conditions (1) "rheumatic" heart disease with aortic stenosis and regurgitation and probably mitral valve disease, angina pectoris, and congestive failure, and (2) cardiovascular lues with aortic regurgitation, angina pectoris, and congestive failure The functional diagnoses are easy It is the etiological and structural changes that are not so easy However, if it is certain that an aortic systolic thrill was felt and since we have evidence that the aorta was not dilated, that the Hinton reaction was negative, and that this man developed symptoms before he was forty, the diagnosis is preponderantly that of rheumatic heart disease, I should say at least eighty per cent probable Aortic stenosis is a very important lesion and has been often overlooked in late years It is not uncommon It is almost as common as is mitral stenosis, we find this out when we look for it

Cardiovascular lues must be considered as our second diagnostic choice, but way down the line Subacute bacterial endocarditis with vegetation on the aortic valve would not be very likely because of the history dating back fifteen months and the attack after his first admission Then there are other conditions of unknown etiology On several occasions during the past few years we have been surprised by finding large hearts with no explanation of the enlargement But here the diagnosis seems to me almost certainly that of rheumatic heart disease with aortic stenosis and regurgitation, mitral valve disease, and angina pectoris, which may mean an important degree of coronary disease, although we have also found it (angina pectoris) in middle-aged patients with aortic stenosis, which may cut down the coronary blood flow without the presence of much coronary disease

Finally we come to the terminal illness, which so far as I can see is probably that of mesenteric embolism There may be some other complicating surgical condition, but the cardiac enlargement suggests intracardiac thrombus formation with embolism as the terminal event

DR HOWARD B SPRAGUE When I saw this patient first I favored the luetic diagnosis because of the fact that he was discharged from the army in 1919 with a normal heart, because he had had two Neisser infections, and because he had had such a rapid downhill course That was before his x-ray study After finding that there was no dilatation of the aorta sufficient to account for the rather slight systolic thrill

that one sometimes gets in luetic aortitis, and finding a generally enlarged heart, I felt that the diagnosis was probably rheumatic heart disease with aortic regurgitation and some stenosis, probably with mitral involvement, although the possibility of a complicating luetic aortitis might be considered

DR WHITE Yes, one must consider the possibility of "rheumatic" aortic valve disease complicated by luetic aortitis, which would help to explain the angina pectoris and the electrocardiogram.

DR SPRAGUE The electrocardiogram showed definite bundle branch block I thought that probably could be explained by some interference with the coronary ostia dependent upon the aortic valve disease

DR. FREDERICK T LORD Our diagnosis, as far as the heart was concerned, would coincide with Dr White's, that is an aortic valve lesion and mitral involvement, but the latter would have to be considered as possibly functional, as the diastolic may be an Austin Flint murmur rather than an indication of actual involvement of the mitral valve Angina pectoris seemed reasonable from the story There was also congestive failure The most troublesome aspect from the diagnostic point of view was the abdominal disturbance The pain was low in the abdomen, colicky in nature, and associated with bloody stools The complex suggests some abdominal condition We considered congestive failure as a possible explanation, but it did not seem reasonable to think that congestive failure could account for the colicky abdominal pain, and mesenteric thrombosis seemed a reasonable conclusion

As far as the lungs were concerned we did consider, because of the suggestion from the X-ray Department, that he might have an infarct or a bronchopneumonia I should think however on looking at these films that one might ascribe the pulmonary disturbance to congestive failure

CLINICAL DIAGNOSES

Rheumatic heart disease
Congestive failure
Mitral stenosis
Aortic stenosis and regurgitation
Mesenteric thrombosis

ANATOMIC DIAGNOSES

Cardiac infarct
Coronary sclerosis
Chronic endocarditis of the aortic valve, with slight stenosis and regurgitation
Fusion of posterior aortic cusps
Cardiac hypertrophy and dilatation
Peripheral edema
Chronic passive congestion

large amount of hemorrhage. It was not so in this case. We waited until the patient was really in good labor.

She made a perfectly normal convalescence and was discharged eleven days later in good condition.

The urine was sent to Dr. Albright's laboratory for an Aschheim-Zondek test which at that time was reported negative.

DR TRACY B. MALLORY: Dr. Titus, will you discuss the case?

DR R. S. TITUS: I think the most interesting thing about it is the fact that the bleeding occurred so early. It is unusual for the bleeding in a hydatid mole to start as early as this.

The next interesting feature is the absence of very unusual increase in the size of the uterus as time goes on. These moles oftentimes go way beyond three months and have been known to go six or seven months with tremendously big uteri.

The physical diagnosis when one has courage enough to make it is made on the abnormal increase in size of the uterus which suggests it and makes one think it exists but it usually is not absolute until one sees the discharge of grape-like bodies that are pathognomonic of the condition.

I am interested to know if Dr. Gustafson has seen the patient since she left the hospital.

DR GUSTAFSON: This is a very recent case.

DR TITUS: The association between this disease and chorioepithelioma always leads one to feel that the patient should be watched for six months or more afterward.

The next question that comes to my mind is whether the profession has changed its mind regarding the possibility of giving radium subsequent to curettage. These cases are not at all common. In private practice I have seen only two, and in one of these the diagnosis was made by the patient herself as much as by anybody else. She had a tremendous amount of bleeding that she described as watery and pink, and when she came into the hospital she was still bleeding a watery discharge, no grapes. When one put the speculum into the vagina, however, one could see the grapes coming through the cervix as well as on the cervix.

DIAGNOSIS

Hydatid mole

PATHOLOGIC DISCUSSION

DR MALLORY: The surgical specimen is exactly what one would expect. I would estimate its size somewhat higher. There is at least 500 cubic centimeters of material here, innumerable grape-like spherules.

The most interesting thing from the pathologic point of view is always the question of ruling

out chorioepithelioma, the malignant form of the same tumor. Often the slides of these moles show a considerable degree of active proliferation, and it may be very difficult from the slide to decide whether or not the tumor is entirely benign. In this case we saw no reason to think it was not benign.

I am not sure that the gross appearance of the material is not more important than the microscopic examination for evidence of active proliferation. I think in a gross appearance like this, one can be quite reasonably safe in considering it benign.

One rather interesting point in regard to moles which has only recently received much attention is the frequency with which multiple lutein cysts develop. I have here the ovaries of another patient in whom each ovary contains a half dozen large lutein cysts.

DR JOE VINCENT MEIS: I should like to say a few words. Almost all the literature states that this ovarian condition is not an uncommon thing, that the moles must not be removed, and that if the mole or the chorioepithelioma is removed they retrogress. I think, however, that this case which Dr. Mallory has just mentioned gives a very different point of view, because there is no normal ovarian tissue left at all and it probably could not retrogress. I think that this is probably the same sort of response in the ovary that we get in using the luteinizing hormone, which is made from the urine of a pregnant woman, and acts upon the ovaries. We have not treated and operated upon enough cases to say how it would affect the ovaries of the patients if used long enough. I believe that it would be possible to produce some cystic mass as this tumor in the ovary if we used it long enough. Women with chorioadenomas and hydatidiform mole have five or ten times as much luteinizing hormone in the urine as does the normal woman. It seems to me that the urine of a case similar to Dr. Gustafson's, or any chorioepithelioma or hydatidiform mole, should show quantitatively an increase in this hormone, and thus a diagnosis could be made. Whether there is a standard or not I do not know, but Aschheim and Zondek say it is possible to make a diagnosis in that way. I think it is important to have the patient's urine tested again to be sure there is no recurrence of mole or epithelioma in the uterus, because if it does occur it may mean the development of a chorioepithelioma. The literature as far as I can tell states that chorioadenoma, which is the non-malignant type of chorioepithelioma, develops following hydatidiform moles, whereas chorio-carcinoma, which is very malignant, usually follows normal pregnancies.

We have had about fifteen hydatidiform moles in this hospital and about seven chorioepitheliomas. In only one instance was there

early miscarriage In view of the fact that the bleeding had been going on for two weeks it was considered safe to make a vaginal examination It showed a very tight introitus and the uterus not palpably enlarged in normal position The adnexa were not enlarged and were not particularly tender She was advised to take one teaspoonful of ergot three times a day for four days and to return for an examination Four days later she said that there had been quite free bleeding without clots for the first two days The flowing had practically ceased She continued to take ergot She was seen again in six days She said that the bleeding had decreased in amount, although it was still present Bimanual examination showed the uterus to be apparently slightly enlarged She still continued to have nausea and vomiting in the morning for which she was advised to eat frequent small carbohydrate meals She was seen again two weeks after the third visit The nausea and vomiting had persisted and there had been practically no bleeding Examination showed the uterus to be definitely enlarged The adnexa were negative Three weeks later she complained of considerable nausea and vomiting Bimanual examination showed the uterus to be enlarged to the size of a three and a half months' pregnancy Early in the morning, two days before admission to the hospital, after intercourse the previous night, she had a small amount of red bleeding, and had similar bleeding on the following morning and again on the day of admission

Family history Her mother had twins

Physical examination On admission the uterus was enlarged to the size of a four months' pregnancy

She was kept in bed and given sedatives She continued to have considerable staining Eight days after admission she was given morphia and scopolamin early in the afternoon After they became effective she was given hourly two minim doses of infundin intramuscularly until 9 30 p m The following day she had only an occasional uterine contraction with a very small amount of bleeding She was then given repeated two minim doses of pituitrin, and on the following day eight three minim doses of pituitrin This did not produce any labor Two weeks after admission she was discharged The bleeding had practically stopped

History of interval Following her discharge she was seen at regular intervals She continued to bleed a little from time to time, and on the day before admission began to have uterine contractions

Second admission She was readmitted eight weeks after her previous discharge in labor, with pains coming about every five minutes Shortly after admission she was examined rectally bimanually with the escape of fluid and hydatid material Fifteen minutes later she passed a very large quantity of mole and fluid,

about 300 cubic centimeters A dilatation and curettage was immediately performed She was given pituitrin and ergot, one ampule each The uterus shut down very satisfactorily without excessive bleeding She made a normal convalescence and was discharged twelve days after admission

CLINICAL DISCUSSION

DR PAUL GUSTAFSON A vaginal examination was made at the first office visit because of the fact that bleeding had been going on for two weeks Of course there is very little increase in size in the first month of pregnancy, so that the uterus did not seem unusual The most likely diagnosis seemed to be an early in complete miscarriage because of the early bleeding for some time, and because the uterus was not enlarged I felt we had nothing to expect and the patient was given fluid ergot Later a diagnosis was made of possible continuing pregnancy because of the vomiting and nausea In other words we backed away a little and thought that in spite of ergot and bleeding pregnancy might be continuing I might add that this young woman was very nervous and one who might be expected to have a great deal of vomiting

The fact that at the fourth office visit the uterus was enlarged to the size of a three and a half months' pregnancy led to the thought of multiple pregnancy or mole We thought of the possibility of hydramnios, which is found early in pregnancy in cases of anencephalic monsters, etc

You are wondering why we did not do something We did not know positively that she was not normally pregnant

"On admission the uterus was enlarged to the size of a four months' pregnancy" My impression was that the uterus had not grown since her fourth visit Her last period was five and a half months earlier and the uterus was small, whereas a couple of months previously it had been large for the date

The blood pressure was 150/90

There is something which I did not know at the time but which she told me later She noticed small masses coming away from the vagina that looked like grapes She did not tell me because she did not want to bother me and wanted to wait until she had labor pains She was examined bimanually and, on pressing on the fundus, material which grossly looked like hydatidiform mole was passed

She was curetted under gas oxygen anesthesia and a large amount of hydatidiform material was removed The amount was estimated at 350 to 400 cubic centimeters At the time of operation it was not found that the uterine wall was thin, as is reported in some of these cases There was an unusually small amount of bleeding at the time of operation These cases are sometimes reported to have an extremely

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THE LAW PROVIDING FOR THE EXAMINATION OF ALLEGED CRIMINALS BY PSYCHIATRISTS

In 1921 the Legislature of Massachusetts was led to incorporate in its statutes a law which gives authority to the courts to have those charged with murder, and awaiting trial examined by two psychiatrists for the purpose of receiving from the examiners a report which may be of assistance to the court in dealing with the defendants.

In the cases against three persons alleged to have committed murder (who will soon be tried before a Judge of the Superior Court of Massachusetts), Dr L. Vernon Briggs and Dr Earl K. Holt have been selected to examine these persons.

Dr Briggs was the advocate of this law, and his name has been associated with it. Dr Holt

is the Superintendent of the Medfield State Hospital for the insane.

A very general approval of this law has been expressed repeatedly and the application of its provisions has, in previous court trials, changed the atmosphere of the courts which have tried murder cases since the passage of the act.

Previous to 1921, the divergent opinions of medical experts in murder trials reflected unfavorably on the medical profession, and led the courts in many instances to pay comparatively scant attention to the testimony of physicians. The reactions of juries were equally unsatisfactory.

In the cases of the accused who will soon be tried, where the opinions of Dr Briggs and Dr Holt will be before the court, the lawyers for the defendants have been quoted in the newspapers as planning to attack the present law and to employ experts of their own selection to combat the opinions of the psychiatrists appointed by the court.

Publicity has been given to the alleged fact that one of the defendants was formerly examined by Dr Abraham Myerson, and that he (Dr Myerson) has been permitted to be present during examinations conducted by Drs Briggs and Holt.

Dr Myerson's standing gives promise of no likelihood of unethical behavior, but if men of less experience participate in the court procedures, the attitude of the courts and the behavior of the doctors will be watched with interest. It is not at all probable that, after these years of dealing with criminals under the present law relating to the psychiatric study of defendants, the present system will be found to be defective because lawyers of standing have not found reason for attacking it and the feeling seems to exist that justice has been promoted. Massachusetts has, thereby, been accredited by other states as having found a better and more dignified way of using expert testimony than is in vogue elsewhere.

GENERAL PARESIS AND MALARIA

In the monthly abstract *Journal of the Public Health Service* for February 1934, there is reference to an article in *Bull. de l'Office international d'hyg. pub.*, Paris 1933, XXV, 1769 by A. Lutrario, which seems to indicate that persons who have had malaria are less likely to develop paresis, because in those areas where rates of deaths due to malaria were highest, the rates for general paresis were unusually low. For example, in Liguria the death rate for malaria was only 0.2 per 100,000, whereas the death rate for general paresis was 2.9 per 100,000.

The treatment of patients with general paresis by artificially induced malaria, according to some reports, has resulted in amelioration of the parietic symptoms.

any mention of the ovaries, and in that case there were small cystic ovaries, but no mention was made of enlargement, so I do not believe large cysts such as these are as common as one would be led to believe from various textbooks

DR MALLORY Have you any comment, Dr Gustafson?

DR GUSTAFSON There does not seem to be much more to say I was very much interested in looking up the series of cases in the Boston Lying-In Hospital during the past eighteen years

Of course it comes down to the way to treat these cases In some of the literature, especially in the writings of Dr Schumann of Philadelphia, there has been a tendency to favor laparotomy in these cases, doing a hysterotomy and shelling out the mole when one can see exactly how the mole looks and the uterine tissue looks

In the Lying-In Hospital during the past eighteen years we had eighteen cases of mole with one death occurring in a case where there was so much bleeding when the vaginal examination was made that it was decided to go in above and shell out the mole That operation was successful enough in itself except that the woman developed sepsis and on the thirty-ninth postoperative day developed intestinal obstruction and was operated on again, but died on about the forty-fifth day after the abdominal operation The other cases were all delivered from below One of these patients had toxemia with convulsions She was three months pregnant and had all the typical signs of eclampsia, of which mole has been mentioned as a cause, and toxemia is more likely to develop in cases of hydatidiform mole Of course that lends

some strength to the theory that it may be found in the placenta or in degenerated placenta

This case I treated very conservatively I did not want to dilate and curette and invite a lot of bleeding, I wanted to wait until the patient started in labor herself Two other patients of mine have been treated the same way perfectly satisfactorily I feel that it should be done very carefully, especially since there is a possibility of invasion of the uterine musculature by the mole It also seems, however, that the development of the Aschheim Zondek test will give us evidence of any remaining mole or developing chorioepithelioma by the quantitative pregnancy test which was mentioned by Dr Meigs If we can shell the fragments out by hand and as long as the uterus is shutting down and consequently the uterine wall getting thicker, it is safe to curette carefully with a large blunt curet It seems to me that abdominal hysterotomy should be reserved for the rare cases that fail to respond to treatment below

So far as the diagnosis is concerned, there is no question that it could have been made much earlier by means of a quantitative Aschheim-Zondek test Sometimes one feels that it is just as well not to spend an extra ten dollars of a patient's money when the diagnosis is going to come out sooner or later

DR MEIGS I did not know that anyone here could do the quantitative test

DR GUSTAFSON In Philadelphia they do it quite often What they do is to dilute the urine It is said that in a case of hydatidiform mole as little as one thirtieth of one cubic centimeter of urine will give a positive reaction

article on a subject of general interest in connection with the venereal diseases and numerous abstracts from the current literature pertaining to these diseases. In the preparation of this abstract journal, more than 350 of the leading medical journals of the world are reviewed and abstracts made of the articles on this subject.

The cost of *Venereal Disease Information* is only fifty cents per annum, payable in advance to the Superintendent of Documents, Government Printing Office, Washington, D C. It is desired to remind the reader that this nominal charge represents only a very small portion of the total expense of preparation, the journal being a contribution of the Public Health Service in its program with State and local health departments directed against the venereal diseases.

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

CANCER OF THE INTESTINAL TRACT*

BY WILLIAM M. SHEDDEN, M.D.

Cancer education is worth while. It is shortening the time between the discovery of the disease and the receiving of proper treatment. It need not frighten the listener, it should bring hope for there is a stage with every cancer *when it is curable* and it is with the desire to get more curable cases to seek early and adequate treatment that this brief talk is offered. Delay is dangerous.

You have often been told that cancer is like a flaming match in the woods. To extinguish the tiny spark at once is a simple matter but to fight it when it has grown into a large monster and has spread to distant parts that is quite a different matter.

One of the reasons why so many people die of cancer lies in the fact that the disease usually exists for some time before it is properly treated.

The intestine is really quite a wonderful piece of anatomy. Do you realize that the average adult carries around inside of him a tube twenty-eight feet long, twenty of it small and the remainder large intestine? The small intestine is mostly concerned with digestion of food and the large intestine is concerned with absorption of water. The large intestine is festooned across the abdomen swinging from two fixed parts, one high up in the left abdomen and the other high up on the right. Low down on the right side in the average normal man or woman the small intestine joins the large and it is here that resides our famous friend or enemy, the appendix. The rectum which is the last six inches of the large intestine lies low down in the abdomen in the midline.

Connected with this long twenty-eight foot tube

are many little blood vessels and also a network of little tubes called lymphatics. We are deeply concerned with these little lymphatic tubes for they and the veins can carry cancer cells and scatter them over the body.

DA N G E R S I G N A L S

A point that must be emphasized is that early cancer of the intestine may be present without giving any symptoms whatsoever, for there is a period, sometimes long and sometimes short, when the cancer is not large enough to disturb the intestine. "Well—how—?" you may ask, "are we going to be saved from this disease if it gives no symptoms?" Simply by going to your doctor once or twice a year for a routine health examination and this should always include a rectal examination. False modesty should never permit us to neglect that part of the examination.

Let us now consider *early symptoms*. First *any change* in bowel habits no matter how slight should be considered important until proved otherwise. The change may show itself in increasing constipation. Don't treat yourself for this or let the druggist prescribe. Don't take oil or cathartics unless suggested by your doctor. I'll tell you why, early symptoms may disappear under such treatment but the cancer remains. Oil allows material to pass through a channel narrowed by disease whereas if the oil were not taken the discomfort would take the patient to a doctor and thus a diagnosis would be made.

A second early symptom may be a slight attack of diarrhea. Of course this sort of an upset is common, while cancer of the intestine is uncommon. However, more than one such attack within a period of a few days is an indication that the individual should see a doctor. Chronic diarrhea in an elderly person is often due to a malignant growth. But don't forget that cancer is not confined alone to elderly people. I have recently investigated over thirty cancers in boys and girls under twenty. Of course, this is rare, but it does occur.

A third early symptom of intestinal cancer is a persistent mild stomach upset, indigestion, or dyspepsia or discomfort in the pit of the stomach, though usually *early cancer* does not disturb either the appetite or the digestion.

Persistent rumbling of gas may be a warning signal.

Pain is rarely important as an early symptom probably because the nerves running from the intestines are so arranged that the mere presence of a tumor does not cause pain.

A frequent urge to relieve oneself of intestinal contents is frequently an early symptom if the growth is low in the intestine, that is near the outlet.

Blood may of course come from anywhere along the intestine. If it is bright it probably comes from the lower end. If it is black it probably comes from a higher level.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors

JOSLIN, ELLIOTT P B A, Ph B, M A, M D Harvard University Medical School 1895 Medical Director, George F Baker Clinic of the New England Deaconess Hospital His subject is "Cooperation in the Care of the Patient" Page 615 Address 81 Bay State Road, Boston, Massachusetts

CRONE, NEIL LOUIS M D Harvard University Medical School 1931 Former House Officer, Massachusetts General Hospital His subject is "The Treatment of Acute Polomyelitis with the Respirator" Page 621 Address Massachusetts General Hospital, Boston, Massachusetts

MORRISON, LAWRIE B M D University of Vermont College of Medicine 1902* The construction of his contribution was in association with

MORRISON, SIDNEY L M D University of Vermont College of Medicine 1910 Roentgenologist, New England Baptist Hospital, Faulkner Hospital, Robert Breck Brigham Hospital, and Corey Hill Hospital Address 370 Marlborough Street, Boston, Massachusetts, and

DELANEY, JOSEPH H B S Montana State College 1930 Now Senior student at Harvard University Medical School Address Harvard University Medical School, Boston. Their subject is "Herniation of the Fundus of the Stomach Through the Esophageal Hiatus With Special Reference to its Roentgenologic Diagnosis" Page 624

RICHARDS, ESTHER LORING B A, D Sc, M D Johns Hopkins University School of Medicine 1915 Associate Professor of Psychiatry, Johns Hopkins University Associate Psychiatrist, Johns Hopkins Hospital Physician-in-Chief, Phipps Psychiatric Dispensary, Johns Hopkins Hospital Lecturer in Mental Hygiene, School of Hygiene and Public Health, Johns Hopkins University Visiting Psychiatrist, Baltimore City Hospitals Her subject is "Practical Features in the Study and Treatment of Anxiety States" Page 633 Address Johns Hopkins University, Baltimore, Maryland

EMERY, EDWARD S, JR A B, M D Harvard University Medical School 1920 Instructor in Medicine, Harvard Medical School Associate in Medicine, Peter Bent Brigham Hospital His subject is "The Treatment of Peptic Ulcer Complicated by Hypersecretion" Page 637 Address 319 Longwood Avenue, Boston, Massachusetts

KASANIN, JACOB B S, M S, M D University of Michigan Medical School 1921 Clinical Director, State Hospital for Mental Diseases, Howard, Rhode Island Formerly Research Associate, Boston Psychopathic Hospital, Boston, Massachusetts, Lecturer in Psychiatry, Massachusetts University Extension and Brown University His subject is "Leucocytosis in Mental Disease" Page 641 Address Howard, Rhode Island

WAITE, FREDERICK C B Litt, A M, Ph D Harvard University 1898 Professor of Histology and Embryology, Western Reserve University since 1906 Formerly Assistant in Anatomy, Rush Medical College His subject is "Dr Lucinda Susannah (Capen) Hall" Page 644 Address Western Reserve University, Cleveland, Ohio

MISCELLANY

THE PROMOTION OF DR BAINBRIDGE

Dr William Seaman Bainbridge has been promoted to the position of Medical Director in the United States Naval Medical Reserve with the rank of Captain

INTERESTING COMPARISONS OF NORTH CAROLINA AND MASSACHUSETTS

According to a weekly newspaper published in Moore County, North Carolina, 371 of the 1833 physicians of that state, or more than one-fifth, did not receive more than \$1,000 during the fiscal year 1932-1933

The annual occupational license fee for doctors in North Carolina is \$25 00, and those in the income class of less than \$1000 were obliged to pay only one-half of the full license fee, or \$12 50

It was alleged in this report that 309 physicians are practicing in North Carolina, but not paying the required State license tax The population of North Carolina for 1931 was 3,170,276 and in that year there were 2372 physicians making an average of one doctor to 1336+ people In that year there was one doctor to only 644+ people in Massachusetts

Massachusetts doctors do not have to pay an annual occupational tax. Although the average clientele of the North Carolina doctor is more than twice that of his brothers in Massachusetts, we do not hear of our doctors migrating to North Carolina except for recreation, or because of a less severe winter climate

VENEREAL DISEASE INFORMATION

For a number of years the U S Public Health Service has been publishing, for the information of physicians, health officers, and others, a monthly abstract journal known as *Venereal Disease Information* This publication usually contains one original

Omnia minima inspectat
Morbus mult(um) cum delectat.

De Medico Radiorum Incognitorum
Hic est vir cui omnes credunt,
Et cui victimae se dedunt,
Haruspex futurum dicit
Simul viscera inspicit.

De Medico Clinico
Hic dolorem nobis parcit
Omnia post tergum facit
Sacralem hiatus quaerit
Eius hasta alt(e) inhaerit
Monstrum dirum ac horrendum
Corpus reddit moribundum.

De Medicis Domi
Iuvenes albo vestiti
Vos scientiae periti
Quantum eheu cognoscetis
Cum in mundum venietis'

De Nutricibus
Puellae nondum maturae
Quales feminae futurae?
Multum doctae semper bonae
Sed sub tegmentis personae

De Fluoroscopia
Lux fiat' nunc omnes agunt
Fluctus barri insurgunt
Clare per vitrum apparent
Omnia quae celari debent.

De Ventris Exploratione
Facilis descensus est
Averno Non ventris est.
Sed mihi nunc est probandum
Cur utramque descendendum

FALLACIES ABOUT HOME TREATMENT OF THE EYES

Some popular fallacies about home treatment of the eyes are described by Dr William L. Benedict of the Mayo Clinic in the winter issue of *The Sight Saving Review*. He says

"There is very little understanding on the part of the public as a whole that a most potent antiseptic agent is supplied to the eye by natural means that is, by the tears. Laboratory experiments have shown that for most disease-producing organisms normal tears are hundreds of times more effective in protecting the eye than solutions of drugs in such strength as can be borne. The tears are supplied in amounts that are properly regulated, and counteract the effect of most air borne bacteria.

'Because the general public has learned that many eye lotions are put up in a solution of boric acid, the better informed immediately turn to this solution as the one safe substance that can be used for any disorder of the eye. Hence we find that many people are using an eye cup, giving the eye a daily bath in boric acid solution, in the hope that

their disorders will soon pass away and the necessity for visiting a physician may be obviated.

"The healing properties of boric acid are infinitesimal. It is used chiefly by physicians as a vehicle to carry small dilutions of more potent drugs and because it retards the growth of fungi or of contaminating bacteria, it forms a convenient way to dispense medicines for the eye. The practice of giving eye baths with any solution when eyelids are not diseased, except on the advice of an oculist, should be discouraged.

There are very few remedies for the eyes that are specific. There is not one bit of scientific proof that there is any drug or other agent by which the development of cataract can be generally retarded, or by which cataracts can be removed without operation. A great deal of experimental work is being carried out in laboratories and clinics by members of the medical profession with the hope that some means will be found to obviate the necessity of operating for cataracts.

"I think it is well known and appreciated by people at large that there are no miraculous cures for any diseases or disorders of the eye. The faith that our grandmothers had in the use of goats milk, sauerkraut juice, snake oil milk and honey, or tobacco juice has been largely dissipated by an intelligent public. The price the public has had to pay for its experience has been the loss of sight for thousands of people through misinformation, through misdirection, through misplaced confidence, and through ignorance.

'People at large now know the value of cleanliness and the necessity of seeking medical advice when the symptoms of disease appear. They have learned that it is not advisable to attempt to remove foreign bodies from the eye in workshops where the instruments used may be so contaminated as to result in disease of the eye more serious than would be caused by the original injury. They have learned the value of prophylactic treatment of the eyes of the newborn, which has reduced the incidence of babies' sore eyes and consequent blindness to a great extent.

'When we consider the great variety of hazards to which our eyes are exposed in the ordinary pursuits of life the wonder is that many more people are not deprived of the faculty of vision. Serious injuries are relatively infrequent as compared with injuries of other parts of the body. This is partly because the eyes are well protected by being situated in a bony orbit, and partly because they lie behind the eyelids which can be quickly closed.

The incidence of diseases of the eyes caused by infection has been greatly reduced by measures of personal hygiene which people in general have adopted, and because they have come to understand that diseases such as granulated lids and other acute inflammation can be spread by personal contact. There has been an effective campaign also against

LATE SYMPTOMS

If the individual is unfortunate enough to have neglected the disease either consciously or through ignorance long enough, the tumor occasionally becomes large enough to cause a partial or complete blockage. Then at once the symptoms become more acute and cramping pain appears, usually in the lower abdomen, the abdominal wall becomes blown out with gas, there is vomiting and nausea. It is our hope that the sort of a talk you are hearing now will make the picture I have just painted appear less and less frequently. Other late symptoms are anemia, weakness, shortness of breath, and loss of weight. But I must warn you at this time not to be misled by an appearance of good nourishment and weight or color. The haggard emaciated appearance associated in the minds of many with cancer is an appearance noted in the last stages of the disease and usually when nothing more can be done.

Here is what you have a right to expect from an examining doctor. First, that he is respected by his associates. Secondly, that he will take a careful history of the symptoms. Thirdly, that he will perform a careful examination of the whole body and this examination must always include an examination of the rectum with the gloved finger. The importance of this last cannot be overestimated. No patient should be allowed to assume that his symptoms are coming from piles until cancer has been ruled out.

Above the reach of the finger the intestine can be examined by a simple but ingenious instrument known as a proctoscope. The proctoscope is an electrically lighted tube. This can be introduced from below with only slight discomfort and can be done as an office procedure. If your doctor suspects trouble and is not accustomed to this instrument he will refer you to someone who is. To examine the region above that which can be viewed with the proctoscope we made use of the barium enema. Here the doctor examines the patient under an x-ray and watches the course of a small stream of barium introduced from the lower outlet of the intestine. He notices whether it flows up over any suspicious irregularity or meets any obstruction.

X-rays are notoriously unreliable so far as the rectum goes, but above that point are extremely useful. We sometimes also give a small amount of barium by mouth and carefully watch it with the aid of x-ray as it travels down through the intestine.

CANCER PREVENTION

Over and over again attempts have been made to connect the causation of cancer with some article of food, whether eaten to excess insufficiently eaten, or harmful because of some property which it was supposed to possess or be deficient in. But when subjected to the cold analysis of science every theory connecting food with cancer has broken down. No one thinks it is sensible to abuse the intestines but beyond that we cannot go. It has been stated

that hemorrhoids, that is piles, and constipation, are two factors which cause cancer. The best evidence that we have at hand goes to show that this has never been proved. Of course, this does not mean that piles and constipation should be neglected. But it does mean that you should not fear that because you have either piles or constipation you are going to get cancer. Only if your constipation is increasing, should you be disturbed.

TREATMENT

Pills or other medicines by mouth never have and never will cure cancer of the intestines. Ointments and salves never have and never will cure cancer at or near the lower outlet. If the doctor is experienced in treating this disease he will have at his disposal, surgery, radium, x-ray, and an electric instrument known as diathermy. Intelligent use of these means in an early case will result in a high percentage of cures. Don't let anyone tell you that cancer of the intestines is always incurable. It is many times curable, always if removed early enough. It is not sensible to avoid proper treatment by a competent doctor. It is not sensible to fear treatment.

Delay is dangerous!

DE MEDICIS CETERISQUE*

(Meditationes ab aliqua lecto affixa)

De Medico Patre

Hic est vir qui semper dicit
Tempus omnia mala vicit
Sed quod tempus longum est
Ad scient(iam) eundum est.

De Medico Medicamentorum

Hic est vir ingeni fortis
Qui delet terrorem mortis
Cum anemiam suspicat
Aut venenum plumbi captat
Omne gaudium prohibet
Iecur ferrumque praescribit

De Medico Orthopedico

Hic est vir novioris artis
Doctus posterioris partis
Modis aevi saevi utens
Corpora et brachia trahens
Costas muris saxi cingit
Caud(am) equinam punctis pungit.

De Medico Nervorum Docto

Hic est vir qui malleum portat
Genus, talos, cutem temptat

De Medico Morborum Docto

Hic vir semina reperit
Longam vestem albam gerit
Urinam in testis tegit
Sanguinem in urnis cogit

*These verses were written by the sister in law of a Boston doctor while she was confined to bed by a long illness. The fact that the *Journal* publishes this poem proves that the Editors have a high opinion of the clinical ability of the *Journal's* readers.

members, to such an extent as is possible the backing of this Bill. Our reason for this request is as follows

- 1 Only by such a Bill can the 4 600 000 citizens of the State be protected.
- 2 The police departments of Massachusetts are in no manner affected by the control of the Commissioner of Public Safety and his four Associate Commissioners, except when as and if members of the local departments cease to be efficient and honest police officers
- 3 The morale of such a coördinated police force throughout the State will form the fourteen to sixteen thousand police officers into a group respected by the citizens and feared by the law breakers
- 4 This unified police body will depend no more on political favor or political appointment.
- 5 Police officers who "go wrong" under such a system will be tried by their own Boards in their own local departments and the findings of these Boards will be subject to appeal to the Disciplinary Board at the head
- 6 Accountment of every nature including modern crime-fighting apparatus will be at the disposal of the local departments
- 7 Training school civil service certification and method of advancement are things the whole State is in agreement on

Last but not least, the gradually mounting opinion of this State expressed by telephone letter and telegraph, and by personal visits to our offices convinces us that the mass of citizens of this State are in accord for this Bill. The press is unified and definitely for it. The legislative body has definitely turned to its support.

We need your backing and it is your duty to assist in giving your State a real splendid force that will serve as a model to all other states. The heads of families will appreciate the dangers they are in under the present system and will really get to work for this Bill.

Very truly yours,

COMMITTEE FOR PUBLIC SAFETY,

By ROGER W. CUTLER,

Secretary Treasurer

RECENT DEATH

DORCEY—JAMES EDMUND DORCEY M.D. aged 80 years of 174 Harrison Avenue Boston, died at the Massachusetts General Hospital March 13, 1934

He was graduated from the Harvard Medical School in 1878 and after serving in charge of the Albany Hospital for a time he returned to Boston

and opened his office, devoting himself to family practice

Dr Dorsey was known as a dispenser of charity on a large scale. He joined the Massachusetts Medical Society in 1880 and retired in 1929

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MARCH, 1934

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Courtesy WBZ. Fridays, 4 30 P.M.

March

23 How to Keep the Well Child Well

30 Résumé of the Year's Work

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Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health, Blended with Classical Music.

industrial injuries to the eyes Blindness has been materially reduced as a result of campaigns carried out by members of the medical profession and by organization of the laity There is yet great work to be done in educating the public in the care of eyes that have been injured, in the treatment of minor ailments or diseases of the eyes, and in the treatment of diseases of the eyes in their early stages "

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR FEBRUARY, 1934

Measles is unusually prevalent in the eastern part of the state Present indications point to a year of increased incidence as in 1928

Diphtheria reached its lowest reported incidence for Massachusetts, regardless of month or season

Lobar pneumonia reports show nothing remarkable

Scarlet fever is running somewhat lower than usual

Typhoid fever, for the first two months of the year, compares favorably with last year's record figures

Pulmonary tuberculosis is at its lowest reported February incidence

Whooping cough shows a somewhat increased prevalence

Anterior poliomyelitis, chicken pox, epidemic cerebrospinal meningitis, German measles, mumps, and tuberculosis other forms show nothing remarkable

RARE DISEASES

Anthrax was reported from Haverhill, 1, Lynn, 1, total, 2

Dysentery (Amebic) was reported from Boston, 2, Canton, 1, Clinton, 1, total, 4

Dysentery (Bacillary) was reported from Boston, 1, Medfield, 1, total, 2

Encephalitis Lethargica was reported from Boston, 1, Holyoke, 1, Westfield, 1, total, 3

Malaria was reported from Chelsea, 1

Cerebrospinal Meningitis was reported from Boston, 1, Dalton, 1, Fitchburg, 1, Grafton, 1, Lowell, 1, Peabody, 1, total, 6

Pellagra was reported from Revere, 1

Septic Sore Throat was reported from Beverly, 3, Boston, 6, Braintree, 1, Everett, 1, Medford, 2, Milton, 1, Stoneham, 1, Taunton, 3, Upton, 1, Weston, 1, Worcester, 1, total, 21

Trachoma was reported from Boston, 1

Trichinosis was reported from Boston, 2, Lexington, 2, total, 4

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

MONTHLY REPORT FOR FEBRUARY, 1934

Disease	Feb 1934	Feb 1933	Aver age*
Anterior Poliomyelitis	—	1	3
Chicken Pox	1157	1106	1005
Diphtheria	27	91	242
Dog Bite	356	318	277
Epidemic Cerebrospinal Meningitis	6	1	9
German Measles	57	51	128
Gonorrhea	416	427	441
Lobar Pneumonia	552	466	653
Measles	8637	982	1654
Mumps	488	718	729
Scarlet Fever	972	1499	1462
Syphilis	350	340	287
Tuberculosis Pulmonary	205	213	330
Tuberculosis Other Forms	33	35	39
Typhoid Fever	9	4	11
Undulant Fever	—	—	—
Whooping Cough	1273	732	799

*Average number of cases for February during the preceding five years

CORRESPONDENCE

THE POLICE UNIFICATION BILL,

The Massachusetts Medical Society
Office of the President, Dr William H Robey
202 Commonwealth Avenue
Boston, Mass

March 13, 1934

The Editor,
New England Journal of Medicine,

Since the support of any measure by the Massachusetts Medical Society cannot be given without the consent of the Council, I am asking you to print the following letter in order that the members of our Society may take individual action The letter explains its importance and we hope that members of the Massachusetts Medical Society throughout the State will read it with care

Very truly yours,

WILLIAM H ROBESY, M D

Committee For Public Safety
11 Beacon Street
Boston Massachusetts

March 9, 1934

Dr William H Robey,
Boston, Mass
Dear Sir

We ask that your organization support in writing, and by the presence of its officers at hearings at the State House the Police Unification Bill of the Committee for Public Safety

We also ask that you obtain in writing from your

members, to such an extent as is possible, the backing of this Bill. Our reason for this request is as follows

- 1 Only by such a Bill can the 4 600,000 citizens of the State be protected
- 2 The police departments of Massachusetts are in no manner affected by the control of the Commissioner of Public Safety and his four Associate Commissioners except when as and if members of the local departments cease to be efficient and honest police officers
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REPORT AND NOTICES OF MEETINGS

FAULKNER HOSPITAL CLINICAL MEETINGS

On Thursday afternoon, March 1, at 5 00 P.M., the regular monthly meeting of the Staff of the Faulkner Hospital was held at the hospital.

Two of the cases which had come to autopsy during the month were presented for discussion.

The first one emphasized the danger which is always present in a person who has gallstones. This patient had suddenly been taken ill with abdominal pain and vomiting. This was associated with the appearance of jaundice and also with a very small output of urine as the disease progressed. By the time the patient arrived in the hospital she was in such a condition that operation was not considered advisable, and before sufficient improvement developed so that an operation could be attempted, she died. At the postmortem examination there was found acute infection in the gallbladder associated with gallstones, an acute pancreatitis and an acute nephritis.

The other case was especially instructive as it supports the contention of pharmacologists that avertin may be exceedingly dangerous. This was the case of an elderly man with Paget's disease and a fracture of the femur. Avertin was given on two occasions three days apart in the first instance in an attempt to reduce the fracture by the closed method, in the second, when the leg was operated on in order to reduce the fracture by the open method. Following the operation the patient's temperature became elevated although the pulse rate did not. This elevation of temperature persisted. Four days after the second dose of avertin, jaundice developed. The jaundice became more intense but apparently was not due to obstruction, because bile was always present in the stools. A day or so later the urine became scanty and the patient became drowsy. Death occurred ten days after the second dose of avertin and at postmortem examination there was found an extensive, acute, degenerative lesion in the liver and an acute degenerative lesion in the kidney, both of which were considered to be toxic in origin. There was a bronchopneumonia and a streptococcus septicemia, both of which were thought to be terminal and not the cause of the degenerative lesions in the liver and kidney. These were supposed to be due to avertin.

Dr. Burton E. Hamilton then gave a short talk on 'The Recent Advances in the Clinical Use of the Electrocardiogram' in which he briefly outlined the history of clinical electrocardiography. Following this he demonstrated lantern slides of electrocardiograms illustrating the common disorders of the heart beat and myocardial changes. The object of this demonstration was to enlighten the members of the staff concerning the significance of routine electrocardiograms when taken and interpreted at their request in the Faulkner Hospital, and to sug-

gest the place that electrocardiography may be expected to take in clinical diagnosis. Dr. Hamilton's observation suggested that only in rare cases can the electrocardiograms be expected to furnish us a valuable diagnosis otherwise not obtainable, but that it has become a definite, though perhaps slight aid, in the routine diagnosis and control of the majority of cardiac patients to those comparatively few physicians who have learned to read and evaluate it. Dr. Hamilton has found that the majority of physicians ordering electrocardiograms learn very little from the tracings themselves, and more often than not, gain very little information from the routine interpretation of the electrocardiograms. What the average request for an electrocardiogram usually amounts to is a direct request for advice, such as the implied questions — "Having seen the electrocardiogram do you think the patient has angina, a coronary occlusion, or is there anything wrong with the patient's heart or is the patient simply neurotic?" These and other questions are intensely appropriate. The desirability of accurate answers is evident. Though in many cases the answer cannot be given, in others it can, and in still more cases useful suggestions for methods of settling the question can be offered.

In order to enhance the value of the reports of electrocardiograms in this hospital, it has been suggested that the physician requesting the report give as clear an idea of the situation as possible. For instance, he should among other points state the age of the patient, whether digitalis has been given and if so how much, and the reason for requesting the electrocardiogram, to settle the nature of arrhythmia to determine whether the heart may be the cause of a patient's fainting attacks and so forth.

The next meeting will be held at the Faulkner Hospital at 5 00 P.M. on Thursday, April 5. In addition to the usual clinical pathological conference on the cases which have come to autopsy during the month Dr. Edward L. Young, Jr., will give a short talk on "Some of the Difficulties of Gallbladder Diagnosis." All physicians who are interested are cordially invited.

CARNEY HOSPITAL CLINICAL MEETING

The Staff of the Carney Hospital will conduct clinical meetings on the last Wednesday of each month (excluding June, July, August, and September). The next clinic will be held at the hospital on Wednesday morning, March 28, between the hours of 9 30 and 12 o'clock.

All physicians are cordially invited to attend these clinics.

THE NORFOLK DISTRICT MEDICAL SOCIETY

A regular meeting of the Society will be held in the Faulkner Hospital, March 27, 1934, at 7 15

P.M. Telephone Jamaica 2740 *Please note change in hour of meeting*

Business Action on the minority report presented by Dr Henry M Landesman

Communications 8 15 P.M. Symposium on Varicose Veins Dr Henry H Faxon, Dr Edward A. Edwards

Discussion opened by Dr E E O'Neil
Collation.

FRANK S CRICKSHANK, M.D., *Secretary*
1695 Beacon Street, Brookline

THIRTIETH ANNUAL MEETING OF THE NATIONAL TUBERCULOSIS ASSOCIATION

This meeting will be held at the Netherland Plaza Hotel, Cincinnati Ohio May 14, 15, 16, 17, 1934

Opening General Meeting, Monday, May 14 8 15 P.M.

Address of the President, Dr Stuart Pritchard
Battle Creek, Michigan

Report of the Managing Director, Dr Kendall Emerson, New York

Award of the Trudeau Medal, Dr Esmond R. Long
Philadelphia, Pa

Report of the Committee on Nominations Dr James J Waring, Denver Colorado

Address—The Role of Tuberculin in Tuberculosis Control' Dr Marion Dorset Washington, D C

Showing of Motion Pictures on Growth of Acid Fast Bacteria Ralph W G Wyckoff Ph.D., New York.

For details of the program apply to The National Tuberculosis Association 450 Seventh Avenue New York City

THE AMERICAN ASSOCIATION ON MENTAL DEFICIENCY

The annual meeting of the American Association on Mental Deficiency will be held at the Hotel Waldorf Astoria, New York May 26 27 28 and 29 1934. The Saturday session, May 26 will be given over to the sociological, psychological and the special educational aspects of the problem in order that social workers and school teachers may have an opportunity to attend without interfering with their regular duties. The Tuesday afternoon session will be a conjoint meeting with the American Psychiatric Association. Data as to the program may be obtained from the Secretary Dr Groves B Smith Godfrey Illinois

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance) Tuesday evening March 27 at 8 15 P.M.

PROGRAM

Presentation of Cases

Studies with Diuretic Drugs By Drs Marshall,

N Fulton, William Evans, Jr, A. H Bryan and E. A. Stead, Jr

Studies on Sulphur and Protein Metabolism in Bright's Disease By Drs G P Grabfield and B Prescott.

JOHN HOMANS, M.D., *Secretary*

SUFFOLK DISTRICT MEDICAL SOCIETY

The March meeting of the Suffolk District Medical Society will be held on Wednesday, March 28, 1934 at 8 15 P.M., in the Evans Auditorium at the Massachusetts Memorial Hospitals

PROGRAM

"Gall Bladder Pathology in Children" Clifford D Harvey, M.D

"Ocular Pathology in the Newborn" William D Rowland M.D

'Streptococcus Viridans Mastoiditis and Meningitis with Recovery' Leighton F Johnson, M.D

"X Ray Diagnosis of Cardiac Pathology with Demonstration of the Mechanical Heart.' George Levene, M.D

Electrical Oscillations and Their Significance in Electrocardiography' Samuel H Caldwell, Sc.D, Massachusetts Institute of Technology

Discussion by Drs Lester R. Whitaker, Ralph Hopkins, Maurice Fremont Smith, William D Reid

Refreshments will be served at 10 P.M.

JAMES H. MEANS, M.D., *Vice President*,
GEORGE P. REYNOLDS, M.D., *Secretary*

NEW ENGLAND DERMATOLOGICAL SOCIETY

The Annual Meeting of the New England Dermatological Society will be held at the Boston City Hospital on Wednesday, April 11, at 3 00 P.M.

J HARPER BLAISDELL, M.D., *Secretary*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

March 23—New England Pediatric Society will meet in Boston 4 15 P.M.—Clinical Program Children's Hospital, Longwood Avenue Boston 6 45 P.M.—Dinner Vanderbilt Hall Harvard Medical School 8 15 P.M.—Evening Program—Boston Medical Library 8 Fenway

March 26—New England Heart Association will meet in the Evans Auditorium of the Massachusetts Memorial Hospitals Boston at 8 15 P.M.

March 27—Harvard Medical Society See notice elsewhere on this page

March 28—Carney Hospital Clinical Meeting See page 662

April 5—Faulkner Hospital Clinical Meeting See page 662

April 11—New England Dermatological Society See notice above

April 13, 20 and 27—Salmon Memorial Lectures. See page 443 issue of February 22.

April 16—Boston University School of Medicine to Conduct a Clinical Meeting at Boston City Hospital

April 16 20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E R. Loveland, Executive Secretary 133-135 South 26th Street, Philadelphia, Pa.

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C. Guy Lane 416 Marlboro Street, Boston, for details

May 14, 15, 16, and 17—Thirtieth Annual Meeting of the National Tuberculosis Association See page 663

May 26, 27, 28, and 29—The American Association on Mental Deficiency See page 663

July 24-31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnitz General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements

September 4, 5, 6—International Union Against Tuberculosis will be held in Warsaw For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York, N. Y.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday, April 4—Essex Sanatorium, Middleton Clinic 6 P.M. Dinner 7 P.M. Speakers Dr. Elliott P. Joslin and Dr. Howard F. Root, Boston. Subject Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting, at Salem Hospital, 3 30 P.M.

Tuesday, May 8—Annual Meeting Salem Country Club, Forrest Street, Peabody Dinner at 7 Speaker to be announced Subject to be announced

RALPH B. STONE, M.D., Secretary

221 Cabot Street, Beverly, Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

The next meeting will be held on the second Tuesday of May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary

Sunderland, Mass

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The next meeting will take place in May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM, M.D., Secretary

76 Church Street Winchester Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T. A. STAMAS, M.D., Secretary

226 Central Street, Lowell, Mass

NORFOLK DISTRICT MEDICAL SOCIETY

March 27—See page 662

April 17—Hotel Kenmore, 8 30 P.M. Special Business Meeting

May—Annual Meeting Time, place and program to be announced

FRANK S. CRUICKSHANK, M.D. Secretary

1695 Beacon Street, Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

April 5-12 noon at Norfolk County Hospital. Speaker Dr. Elliott P. Joslin Subject Diabetes

May 3-12 noon at Norfolk County Hospital. Annual Meeting Election of Officers

N. R. PILLSBURY M.D. Secretary

Norfolk County Hospital, South Braintree, Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

March 28—See page 663

April 25—Annual Meeting at the Boston Medical Library Election of Officers. Scientific Program, titles and speakers to be announced

The Medical Profession is cordially invited to attend these meetings

JAMES H. MEANS M.D., Vice-President

GEORGE P. REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C. MILLER, M.D. Secretary

27 Elm Street, Worcester, Mass.

BOOK REVIEWS

The Treatment of Rheumatism in General Practice.

By W. S. C. COPEMAN Published by William Wood and Company, Baltimore, London. 209 Pages Price \$3 25

There is nothing particularly new in this book, but there is a good deal of misleading information. For example the author's differentiation of acute muscular rheumatism, fibrositis and lumbago is not clear. There appears, also, to be very little recognition of the so-called mechanical irritant, producing a short period of joint pain, stiffness or swelling in a hypertrophic arthritic. Again, a number of so-called cured arthritics are mentioned. From the description of these cases, and the short periods they were under observation in an outpatient department, they appear more likely to have been arrested cases of non articular joint involvement than true *rheumatoid* or *atrophic* arthritis. No mention is made of the length of time one patient, or a group of patients, was followed. A short period of observation obviously gives a different picture than a period covering years' observation of the same patient.

Osteoarthritis, he considers correctly, simply as a manifestation of wear and tear on tissue, which probably would have remained under the same heading in the United States if specialists had not made a distinct disease of it, with all the beneficial as well as objectionable features attendant when one specializes in something that may be debatable.

Treatment at the present stage of medical knowledge is very well presented in this book, but here again one is impressed with the numerous forms and types of treatment suggested. This leads the reviewer more and more toward the point of individualization in treatment, and the general care and treatment of a patient indirectly help the mechanical impairment of joints up to a certain point.

On the whole, the book is a mixture of good and bad. The last chapter, Chapter 23, prognosis and end results, as the author states, is the most important but one which most writers avoid. One's reaction after reading this chapter is that perhaps this might have been a good rule to have followed. However it is a fair summary of one man's observations concerning the prognosis in arthritis, though such optimistic prognosis may well arouse expectations and hopes which may not be fulfilled. On page 207, under the paragraph heading of 'Infective and Non Infective Rheumatoid Arthritis,' the author states that if a patient is "seen within two months of its onset (arthritis) may be cured within 6 months a cure is still possible within a year a fairly good result may be anticipated but will take perhaps 6 months to accomplish" that, generally speaking, every additional month the disease progresses more time will be needed for treatment. This statement is followed by a paragraph stating that this disease often be-

comes quiescent in two years and at this stage the mechanical or operative aspect of arthritis is introduced. This consists of mechanical interference, altering anatomical defects, but in no way influences the disease itself. Such an unqualified statement of favorable end results in the treatment of arthritis at least of the true rheumatoid progressive type which we see in the eastern part of the United States, seems open to question to say the least. It appears that the writer's conception of the life course of an individual suffering from rheumatoid arthritis is based not on the actual life course of a single individual but rather on a theoretical course made up of segments from the life courses of many individuals.

The Enlarged Prostate and Prostatic Obstruction
By KENNETH M. WALKER, F.R.C.S., M.A., M.B.
BC Second Edition Published by Oxford University Press, London Humphrey Milford, 1933 223 pages

Ten years have elapsed since the publication of the first edition of Kenneth Walker's monograph. During this decade the operation of prostatectomy has been subjected to close scrutiny because of the introduction of new transurethral methods of removing the obstruction at the bladder neck. In the second edition of his book, Walker gives considerable space to the discussion of prostatic resection. His conclusions agree with those of the more conservative urologists in this country.

As a whole, his book is an excellent one well balanced, sane and practical. Especially good are the opening chapters on the anatomy, physiology and pathology of the prostate gland. His condemnation of the practice of closing the bladder after prostatectomy is in accord with the reviewer's opinion of this illogical method. One may well object to his custom of referring to ordinary prostatectomy as a "total removal" of the gland. It is definitely not this, as both the capsule, which consists of compressed glandular tissue, and the posterior lobe are or should be, not removed by either the suprapubic or the perineal operation.

Several other isolated statements may also be questioned. For example Walker says that during prostatic resection the current of fluid should be checked for fear it will wash the fragments into the bladder. Demonstrators of the resection apparatus insist that the current should flow freely at this time to avoid burning out the electrode. Furthermore, a better view of the region under attack is obtained by free irrigation.

On page 94 the author refers to the risk that hypertrophied prostates may become malignant, and says that this risk has been assessed at 13 to 15 per cent. We doubt the truth of this, although we admit that carcinoma and hypertrophy may develop independently in the same gland. Only occasionally, we believe, does cancer develop in the hypertrophied portions of an enlarged prostate.

In his discussion of methods of anesthesia Walker, quoting Barney and Shedden states that "in some 10% of cases in which spinal anesthesia is used a spinal reaction occurs. This reaction is always to be feared and is not infrequently fatal." This observation which appeared in a paper published in 1923, before the use of ephedrin to support the blood pressure became at all general, would hardly be true of spinal anesthesia as it is employed today.

Aside from these few minor criticisms, the reviewer finds Walker's book to be an admirable example of the surgical monograph, especially valuable for the student and the general practitioner.

Surgical Anatomy By GRANT MASSIE. Published by Lea & Febiger, Philadelphia. 458 Pages Price \$6 00

This English manual of Surgical Anatomy, first published in 1930 and favorably reviewed in the *Journal* at that time, aimed to fill a definite place in the teaching of Applied Anatomy from the clinical standpoint. It is extremely difficult for any work of this sort to surpass the classical standard of Treves' Manual, but in its illustrations and in its more modern point of view, this work made an exceedingly favorable impression. In this second edition the entire text has been carefully revised and numerous alterations and additions have been made in the light of current surgical practice. Chief among the additions are new sections dealing with injuries of the Carpus, infections of the Hand, surgical approaches to certain of the Long Bones, and to autonomic nerve system. Some new illustrations have been added bringing the total to 147, of which many are in color and all are admirable. Though not possessed of the amazingly compact inclusiveness of Treves' work, this volume, for the reason stated, remains a very valuable addition to the equipment of the student or teacher of Applied Anatomy.

Bone Growth in Health and Disease The Biological Principles Underlying the Clinical Radiological and Histological Diagnosis of Perversions of Growth and Disease in the Skeleton. By H. A. HARRIS D.Sc.LOND., M.B. B.S. (Lond.), B.Sc. (WALES), M.R.C.S. M.R.C.P. Professor of Clinical Anatomy University College and University College Hospital, London Etc. Oxford University Press London Humphrey Milford. 1933 248 Pages

Your reviewer does not remember having read a more thought provoking medical book. One of its many virtues is the fact that it suggests and proposes and does not dogmatize or conclude. All its pages are filled with information based on long experience, intensive study and a breadth of knowledge made applicable by an open mind and the priceless faculty of imagination. The thirty-one short, beautifully illustrated chapters are grouped under three main headings. Part I interprets the meaning and

mechanism of the "Lines of Arrested Growth" seen so often in radiographs of the long bones of childhood. Part II discusses bone and cartilage growth with special reference to deficiency diseases. Part III considers the significance of the fundamental processes of growth and repair in skeletal disease.

One may even catch a glimpse of the author's personality from a chance sentence. He is discussing certain starvation experiments on young (and evidently appealing) dogs, and remarks "For obvious reasons, *largely sentimental*, these experiments were not carried over a long period of time."

In Part I, Harris has shown that "During the whole period of growth any severe infection or metabolic disease such as diabetes, induces a premature senescence in growing tissues, and the fact is unfailingly and accurately registered in the structure of the bone by the production of a transverse line of arrested growth."

In Part II will be found interesting conceptions of the growth of bone and an original hypothesis concerning the method of formation of the multi-nuclear giant cells usually called osteoclasts. He believes that synovial fluid is produced from the detritus of the decaying cartilage cells and matrix resulting from wear and tear at the joint surface. Perhaps this statement needs further explanation, for, while the theory has been previously advanced, it would not seem to be defended by recent investigations.

The author trenchantly criticizes "Wolff's law" and considers that Jansen 'has demolished many of the most cherished illustrative examples brought forward in support of the orthographic trajectories demanded by the conception of Meyer Wolff.' He also believes that Dr. Honor Fell's experiments have irrefutably shown that the pattern of the trabeculae in bone is not determined by the Meyer Wolff law.

A needed word of caution in relation to the application of the results of animal experimentation to human beings appears, in connection with dietary measures, and he pleads for a complete pathological examination as a check on clinical exactitude.

In Part III there are most interesting and perhaps conception-changing chapters on Achondroplasia, and age changes in the skull, on Osteitis Deformans (Paget's Disease) and on 'Glycogen and Phosphatase in the Metabolism of Cartilage.' The author considers it possible that the various types of hyperplasia and degeneration on the one hand and the various perversions of growth, ranging from generalized skeletal disease to localized tumors on the other, are expressions of fundamental nutritional differences.

How extremely suggestive is this little volume of some two hundred and thirty pages may be gathered by quoting the last paragraph of text. It is evident that the new outlook in biochemistry will necessitate a complete revision of the normal and pathological histology of cartilage and bone, in terms of glycogen, phosphatase, and other substances whose

role is as yet unknown. Although the implications of this chemical approach to the diseases of bone, joints, and teeth have only recently emerged, it is gratifying that a combined radiographic and histological study of lines of arrested growth should lead to a clearer conception of biological processes and open out a new field which calls for fresh methods of attack in order to elucidate the problems of bone growth in health and disease."

The book will be found to warrant a reading and a re-reading not only by research workers but by all physicians seeking information which will aid them in forming conceptions as to the nature and significance of the basic processes concerned in "Bone Growth in Health and Disease."

The Story of Childbirth By PALMER FINDLEY. Published by Doubleday, Doran & Co., Inc. 361 Pages. Price \$3.00.

This is a unique book, by one of the most forthright and forward looking obstetricians in America, dealing in detail with the accumulated traditions of childbirth, from mythological times. It takes up the taboos and customs of primitive races in relation to procreation, and shows the influence of these on present day superstitions and misconceptions regarding pregnancy. Particularly, does it stress the complete absence of scientific support of the commonly accepted belief in maternal impressions and their influence in marking a child. It traces the dawn of scientific obstetrical achievement, the development of operative obstetrics, the discovery of the cause of puerperal fever, the discovery of anesthesia and its application to obstetrics. It then discusses modern obstetrical problems, the question of midwives, the question of the still too high maternal mortality rate, the value of prenatal and postnatal care, the question of birth control, child spacing and abortion, the relation of venereal diseases to pregnancy. It closes with an excellent chapter on the "Modern Maternity Hospital."

The book is attractively bound, is easy to read and is well and generously illustrated. It is equally interesting to the medical student, to the doctor, to the lay man or woman. One feels that it should not be allowed to fall into the hands of a pregnant woman. In the opinion of the reviewer, the chief value of the book is that from an authoritative source the layman may learn in a non-technical and interesting manner the facts connected with child birth, and so may be educated to an understanding of the real need of first-rate obstetrics, and may come to feel an appreciation of the expenditure of time, judgment and effort spent in conducting a woman successfully through pregnancy, labor and the puerperium. It supplies the medical student and the general practitioner with a valuable background of obstetrics past and present on which to build his practical work.

To do these things as well as is accomplished in this book is an achievement.

The History and Epidemiology of Syphilis By
WILLIAM ALLEN PUSEY, A.M., M.D., LL.D. Pub-
lished by Charles C Thomas, 1933 113 Pages
73 Illustrations Price \$2 00

This book comprises three chapters, each a lecture delivered under the Adolph Gehrman Endowment at the University of Illinois, College of Medicine, Chicago. It is an elaboration of certain chapters of the author's *Syphilis as a Modern Problem* published in 1915. He has added the progress of the past eighteen years in our knowledge of the history of syphilis and our epidemiological experience of the Great War.

The first chapter is the story of the beginning and spread of syphilis over the world to the closing of the fifteenth and the opening of the sixteenth centuries. In emphasizing the theory of the American origin, he has used very carefully the early writings in Spain and in other European countries, as well as Williams' exhaustive studies on prehistoric American bones. The second chapter develops the story of the growth of our knowledge of syphilis during the last four hundred years. It is freely illustrated and gives brief sketches of the important investigators of this period with hints as to the background of their times. The third chapter is an orderly discussion of the epidemiology treated under (1) the reservoir (2) the infecting organism (3) the susceptible host (4) the means of transmission.

The book is charming in its artistry and physical qualities and in content is what one would expect from the pen of William Allen Pusey who has been responsible for a textbook on dermatology and several works of literary and scholarly value.

Peripheral Nerve Injuries By LEWIS J. POLLOCK
and LOYAL DAVIS. Hoeber's Surgical Monograph.
Paul B Hoeber, Inc., New York, 1933 Price
\$10 00

The publication of this monograph is well timed for the profession stood in need of an authoritative exposition of the whole subject of peripheral nerve injuries. Sufficient time has elapsed since the war to permit of proper evaluation of the work done during those days when nerve injuries flowed into the military hospitals of the world in a never-ending stream. The various books that came out and articles published in the current literature could not give us full perspective. This work does give us just that perspective as seen through the eyes of two keen observers each a man of wide experience in his chosen field.

The book is well written, well illustrated and well printed. The examination of the patient both before and after treatment, anatomy, diagnosis and treatment are all well covered and the bibliography and indexing are well done.

Such a book as this will be of great interest to those who are particularly in this type of work. It will also be a real help as a book of reference

to the industrial surgeons and those practitioners who meet an occasional case of nerve injury in general practice.

Sex Habits A Vital Factor in Well Being By A.
BUSCHKE and F. JACOBSON. Published by Emerson
Books Inc., New York 204 Pages Price, \$2 50

Too many of the books on sex written for the lay reader are either superficial or confused by detail; they do not go deeply enough to satisfy the intelligent reader, or they bewilder him by technicalities. From both of these faults *'Sex Habits'* is remarkably free. One is impressed by the authors' complete mastery of their subject; they write from a wide experience and a well considered point of view.

The book begins with a description of the physiology of reproduction clearly and simply stated, and well illustrated by cuts which would do credit to any medical textbook. The sexual impulse in its relation to marriage and to society, its aberrations and its abnormalities are then considered. The concluding chapters deal with general considerations—heredity, eugenics and racial hygiene, advice concerning marriage, and monogamy.

While all of it is admirable, certain sections impressed the reviewer as being especially worthy of mention. The chapter on puberty, for example, is written with such wisdom and understanding that all parents and teachers might read it with much profit.

In their discussion of the control and direction of the sex impulse, about which so much has been written and so much loose thinking has taken place, Buschke and Jacobson take a firm stand for self control with monogamy and a "single standard" as the only ideal compatible with a continuation of our civilization. In taking this position, they do not pass over lightly the inherent difficulties in such a course. They admit there is a tendency to polygamy natural to the male and give full weight to the dilemma in which the bachelor between twenty and thirty years of age finds himself. The former they say must be controlled for the sake of the monogamous ideal, the latter problem they hope will be solved by early marriage.

Their views upon abortion will not find a sympathetic reception, especially in this country. They possess a certain logic nevertheless. The question whether a child should be born they maintain, belongs not to the mother but to the State. The State must provide institutions at which abortion can be induced by experts not only when the continuation of pregnancy would endanger the mother's health, but also when no economic provision for the upbringing of the child is forthcoming when the existence of heredity taint makes it almost certain that the offspring will be diseased, when the pregnancy has been the outcome of rape or the seduction of a girl under age and so on. The above passage seems to us the only important opinion expressed in the book to which objection may be made.

at that, certain sections of it will meet with common approval

Medical men need not think that the book is simply a restatement of facts already well known, it is that, but it is more. It is a wise, intelligent, impartial and clear discussion of the problems which are presented to every medical man — in fact, to every human being who has reached the stage of adolescence

Proceedings of the First International Congress of Mental Hygiene, edited by Frankwood E Williams. New York: The International Committee for Mental Hygiene, Inc., 1932. 2 vols

The mental hygiene movement was founded by Clifford W Beers, who, after three years of experience in various mental hospitals, recovered his health in 1903. The first society was formed in New Haven, Connecticut, in 1908, the same year that Beers wrote his autobiography, *A Mind that Found Itself*. Twenty-one years later, national societies had been formed in twenty two countries and in 1930 the first international congress was held in Washington, D C. The two volumes under review consist of the proceedings of this congress and contain a wealth of material on the subject of the world organization of mental hygiene, as well as many individual papers on psychiatry, institutional, educational and social. Appended are important tables giving the statistics of persons in hospitals for mental disease in thirty two countries. There is a useful index.

Neurology By ROY R GRINKER. Springfield, Ill and Baltimore, Md: Charles C Thomas, 1934. 979 Pages. Price, \$8.50

This textbook of neurology, written largely for the student of medicine, is an important departure from the old standard type of book and, in spite of some well marked deficiencies, is a useful addition to neurological literature. The author, an associate professor at the University of Chicago, has drawn his clinical material from the outpatient department and the hospital associated with the medical department of the same University. Far more than the average clinician or teacher, Dr Grinker views neurology as a special field in the biological sciences and, therefore, his book is based upon a thorough consideration of the embryology, anatomy and physiology of the nervous system. This feature greatly adds to the bulk of his volume, which runs to nearly a thousand pages, and seems to the reviewer its weakest point. Granting his conclusions as sound regarding the value of the biological approach to clinical neurology, much of his material can easily be found elsewhere in books that a student *must* buy. Is the duplication worth while? If this material, valuable as it is, were removed, the book would not exceed five hundred pages.

The remainder, the clinical descriptions of diseases

and syndromes, is far from satisfactory. The chapter on brain tumors is good, largely drawn from Cushing and Bailey, that on inflammatory diseases excellent on trauma, adequate, on syphilis, badly written and shows a poor conception of the modern treatment. On the whole, the section on clinical neurology is not sound and shows a marked lack of personal experience when compared with the classic textbooks of Gowers, Oppenheim and even with Osler's *Medicine*.

Each chapter in the book is provided with a short list of references, not always the most important. The illustrations are reasonably adequate and the text well printed. In general, however, one feels that much effort has been wasted on a project ill conceived and not well executed. Would that the author had limited his book to the biological aspect of neurology and left the clinical field to the period of his riper experience!

Amerika und die Medizin By HENRY E SIGERIST, M.D. Leipzig: Georg Thieme, 1933. 352 Pages

To see ourselves as others see us is always a salutary process. The quick, perceiving foreign mind often notes both our strength and weakness in a way impossible for those of us who are part of medicine in America. Professor Sigerist, recently added to the staff of the Johns Hopkins University, has written a stimulating book on American medicine, which cannot fail to interest physicians and educators in this country. His detached viewpoint, broad and sympathetic understanding, wide knowledge and prodigious industry make his book an outstanding contribution to the literature.

The subject is viewed from many angles. About one-half of the book is historical: Indian medicine, the colonial period, the pioneers and great men of American medicine (Morgan, Rush, McDowell, Drake, Beaumont, Gross, Sims, Holmes, Mitchell, Billings and Osler). Nothing of importance is missed and no finer brief biographies of our medical worthies have appeared in print than these of Dr Sigerist's. The group of hospitals, from the Philadelphia General to the great medical centers of New York, form another chapter, while the private clinics, the Mayos, doctors' office buildings and hospitals are not omitted. Medical schools, the curricula, numbers of students, the cost of education, medical literature, birth control, hygiene, and similar topics are discussed, often in some detail.

The illustrations consist of excellent portraits of American physicians, pictures of hospitals and medical schools, tables of important statistics, and a folding map of the United States. The indexes, unfortunately, are much abbreviated. The printing and general appearance of the book leave nothing to be desired.

In general, one feels that this book is a scholarly presentation of the subject. Written mainly for European readers, the work, nevertheless, is an important asset to American medicine. It is worthy of an English translation.

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EXAMINATION OF THE STOMACH BY MEANS OF A FLEXIBLE GASTROSCOPE A PRELIMINARY REPORT*

BY EDWARD B. BENEDICT, M.D.†

ACCORDING to Rachet¹, Küssmaul in 1868 was the first to practise gastroscopy, the subject of his experiment having been a professional sword-swallower. The instrument he used was devised by Desormeaux and depended on an external source of light. No practical results were obtained. Mikulicz in 1881 made further attempts, using a rigid elbowed gastroscope; he felt however that the procedure

Two years ago Schindler², a German physician working with Wolf, a manufacturer, invented the Wolf-Schindler flexible gastroscope (fig. 1). As shown in the diagram, the lower part of this instrument can be bent to facilitate and make safe its passage through the esophagus, and yet in spite of this curvature a system of many lenses conveys the image to the eye. Hence the danger of gastroscopy which has been the greatest hindrance to its general adoption has been completely removed.

In April 1933, through the courtesy of Carl Zeiss Inc., a Wolf-Schindler flexible gastroscope was lent to the Massachusetts General Hospital. Dr. Chester M. Jones and the writer were assigned from the medical and surgical services respectively to make a trial of this instrument. After two months' use a favorable report was given and the instrument was purchased by the hospital. Since its first introduction here the gastroscope has been passed in 75 patients without ill effect in any.

The technique is simple. After preliminary gastric lavage, and medication of barbitol, morphine and atropine, a mixture of equal parts of 10 per cent cocaine and adrenaline (1:1000) is applied locally to the mouth and pharynx. Then with the patient lying on the left side the operator introduces the instrument into the posterior pharynx and esophagus using the fingers of the left hand as a guide in passing the epiglottis. Once it is well entered in the esophagus the gastroscope usually goes down very smoothly. Some obstruction may be met, however, in patients with marked spur formation of the anterior portion of the bodies of the cervical vertebrae. There may also be slight delay at the cardia. In no case should force be used. By introducing the instrument to varying depths, rotating it in all directions, and inflating the stomach with air the greater part of the gastric mucous membrane can be satisfactorily examined. Gastroscopy should not be attempted in the presence of esophageal lesions (except perhaps in certain cases of diverticuli, and then only with the aid of the fluoroscope). Esophageal varix, stricture, carcinoma and ulcer of the esophagus and cardiospasm are all considered definite contraindications. The easiest subjects for gastroscopy are supple cooperative females, the most difficult are muscle-bound uncoöperative males. Most patients do not find gastro-

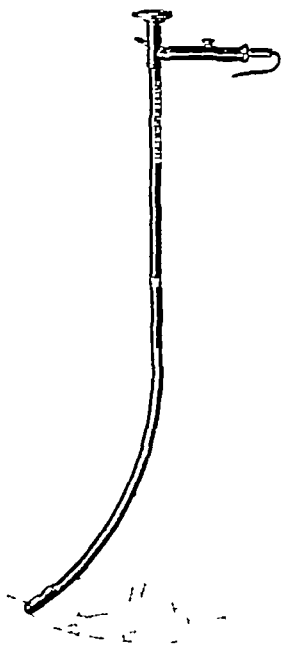


FIG. 1. The Wolf-Schindler flexible gastroscope.

was dangerous and therefore abandoned it. In 1896 Rosenheim successfully introduced a straight rigid instrument but it was difficult to handle and did not prove practicable. Since 1900 however there has been constant improvement in design so that gastroscopy has been carried out in Germany quite routinely in recent years. In this country on the other hand it has not been felt that the results obtained by gastroscopy justified the dangers and discomforts involved in introducing a rigid instrument through the esophagus into the stomach.

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copy a severe ordeal, in fact, one patient slept throughout the examination, and two others said they preferred the passage of the gastroscope to that of the small nasal stomach tube.

The clinical value of the gastroscope has not hitherto been established in this country. The fact that gastroscopy is practised more and more routinely abroad is presumptive evidence of its



FIG 2 Normal stomach showing smooth anterior wall and rugae of both curvatures converging toward the pylorus. Note light reflexes from anterior wall.

usefulness. From experience already gained at this hospital there can be no doubt that direct inspection of the mucous membrane of the stomach is a valuable adjunct to the x-ray in the diagnosis of gastric disorders.

For an understanding of the appearance of

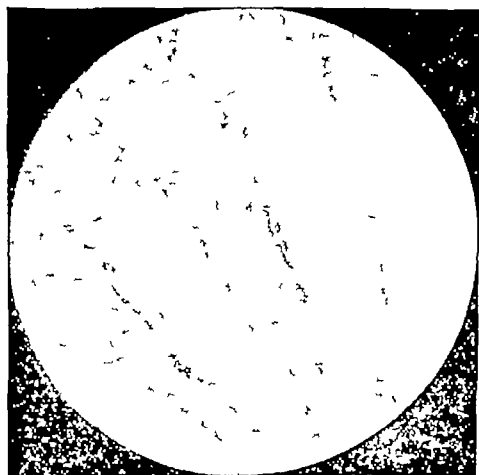


FIG 3 Normal thin parallel rugae of lesser curvature mid portion of stomach moderate inflation

the gastric mucous membrane under various pathological conditions, a brief description of the normal is essential. The usual color is a deep orange red, an appearance which may suggest inflammation to one accustomed to viewing the interior of the bladder. The anterior wall and lesser curvature normally present a smooth,

even appearance, as shown in figure 2*. The pylorus may be seen in about half the cases examined, depending on the shape of the stomach, the cooperation of the patient, and the experience of the operator. Regular shallow folds may sometimes be seen along the lesser curvature, descending toward the posterior wall (fig 3). The rugae of the posterior wall and greater curvature are normally quite prominent and are seen coursing in the general direction of the long axis of the stomach (fig 4). With more inflation these folds naturally become less and less prominent, but seldom disappear entirely in the

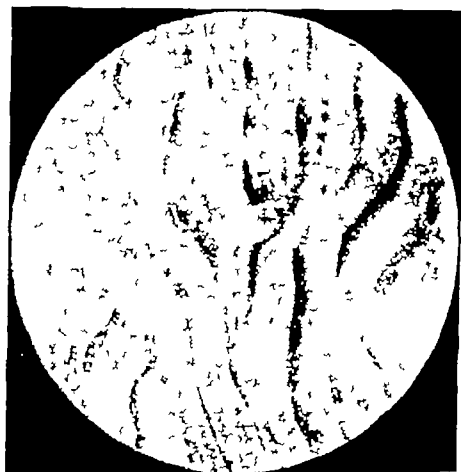


FIG 4 Normal thick rugae of posterior wall and greater curvature coursing in general direction of long axis of stomach slight inflation.

normal stomach. The incisura angularis dividing the antrum from the body is an important landmark, seen as a rounded or elliptical arch.

GASTRITIS

It is generally agreed by most European authors that endoscopy of the stomach is most valuable in gastritis. Henning divides gastritis into acute and chronic types, describing under acute gastritis the exogenous, corrosive, and phlegmonous varieties, and discussing under chronic gastritis the disease entity alone, and inflammation associated with ulcer, carcinoma, postoperative conditions, biliary disease, and pulmonary tuberculosis. The experience thus far gained at this hospital is insufficient to justify affirmation or denial of such a classification. There can be no doubt, however, that gastritis exists, and that, in spite of improved x-ray examination by the "relief method," the ultimate means of establishing such a diagnosis is by gastroscopy. Through the gastroscope some of the usual signs of inflammation are easily seen, particularly the redness and swelling, which result in edematous, tortuous rugae, as seen in figure 5. In many cases the normal topography of the mucous membrane is lacking, and

*Photographs taken from gastroscopic drawings made by Miss Muriel McLatchie. Photography through the gastroscope is possible only when a rigid instrument is used.

in its place there appear erosions (fig 6) with small hemorrhages into the cavity of the stomach or into the mucous membrane, in other cases there is a characteristic hazy edematous appearance with irregular swellings and depressions

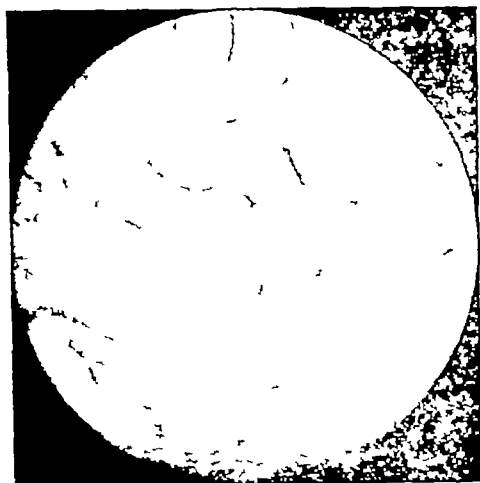


FIG 5 Hypertrophic gastritis Tortuous inflamed edematous rugae. Puddle of bile and mucus on greater curvature (below)

In severe cases there may be mucopurulent exudate between the fold. A net-like arrangement of rugae is sometimes present (fig 7) For

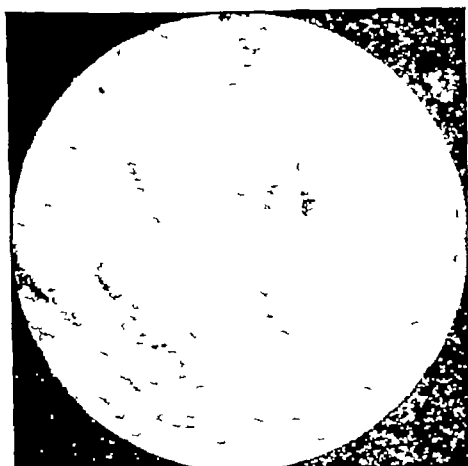


FIG 6 Erosive gastritis

a more detailed study of the various forms of gastritis reference should be made to the writings of Henning³, Schindler⁴, Korbsch⁵, Gutzeit⁶, Konjetzny⁷, etc

The diagnosis of gastritis has been made twenty-two times in this series of gastroscopies, ten times in association with duodenal ulcer, two times with gastric ulcer, three times with carcinoma, two times as a postoperative condition after resection, and five times without other pathology. It is these latter cases which are of the greatest interest, for in them the final diagnosis rests primarily on the gastroscopic find-

ings. The following cases are summarized as examples —

R. G., M. G. H. No 328717, a 60 year-old married Jewish housewife, first entered the hospital April 22 1933 complaining of fainting and tarry stools of one week's duration. For 12 years she had been troubled with indigestion consisting of dull, aching left upper quadrant and epigastric pain and gaseous eructations. There was no apparent relation to meals but soda gave temporary relief. Nine days before entry there was more severe epigastric pain, followed by numerous tarry stools and fainting attacks with progressive weakness and pallor. There was no vomiting. Physical examination showed a rather obese woman with pale, sallow skin and

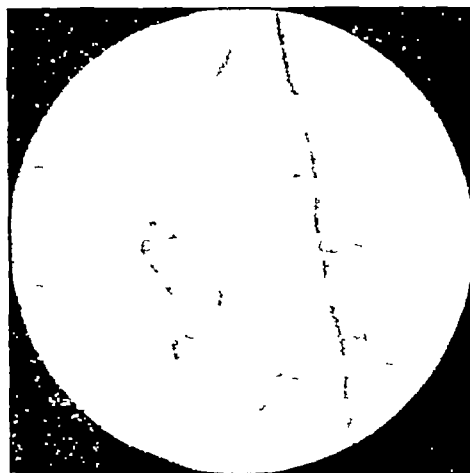


FIG 7 Gastritis Net-like arrangement of folds on greater curvature.

washed-out mucous membranes black feces were present on the glove after rectal examination. The blood pressure was 145/65, red blood count 2.52 millions hemoglobin 35 per cent. A diet of milk and lime water was given and improvement was rapid. Ten days after admission gastrointestinal x-ray was negative and a barium enema a few days later was also negative. Gastric analysis was normal. Exploration was suggested, but not urged as the consulting surgeon did not feel confident of determining the source of the bleeding. Gastroscopy was then performed revealing at the cardiac end of the stomach on the lesser curvature and posterior wall several irregular bright red, actively bleeding areas. From the appearance of the mucous membrane it seemed that bleeding was coming from small benign erosions. Operation, therefore was not indicated. The patient continued to improve rapidly on a bland diet, and was discharged to the out patient department. One month later when seen in the gastrointestinal clinic she was symptom free and had had no further bleeding.

A. P. B. M. G. H. No 332336 a fifty six year old single white American housekeeper first entered the hospital September 29 1933 complaining of dizziness and weakness of four days duration. For one year she had had intermittent attacks of indigestion consisting of cramp-like non-radiating pains across the epigastrium coming on shortly after eating and relieved by vomiting. The eating of a large amount of citrus fruit at the time of onset seemed to be a possible factor. The use of alcohol was denied. There had been a rapid loss of twenty pounds in weight about six months prior to entry. Anorexia was a prominent symptom. Black stools had been

noted on several occasions. Four days before admission, after vomiting a large amount of blackish green material and passing a very black stool, she fainted and fell to the floor unconscious. Since then she had been very weak and dizzy. Physical examination on entry showed a very pale, weak, poorly nourished woman, lying flat in bed and appearing drowsy, the abdomen was negative except for slight tenderness and spasm in the epigastrium. After rectal examination the examining finger was coated with a typical tarry stool. The laboratory findings showed a blood pressure of 130/84, red blood count 1.89 million and hemoglobin 30 per cent. She was regarded as having a bleeding peptic ulcer and given a transfusion of 500 cc of citrated blood. Improvement was rapid so that cracked ice, milk, and lime water were soon allowed. Occult blood was found in the stools constantly for ten days but only very rarely thereafter. Three weeks after admission the patient was well enough to undergo x-ray examination of the gastrointestinal tract, which was reported as showing thickened rugae but offering no explanation for the hematemesis. Special roentgen examination of the esophagus failed to disclose esophageal varices. Barium enema was negative. Gastroscopy was then performed revealing thickened, inflamed rugae with two erosions 1 to 2 mm in diameter along the lesser curvature and a similar erosion on the greater curvature. No active bleeding was seen but there was a small amount of blood on the instrument when it was withdrawn. It was felt in this case that gastroscopy had explained the cause of the bleeding. After another week of rest and bland diet, the patient was discharged home improved with a diagnosis of hypertrophic gastritis. One month later she was seen in the out patient department looking "hale and rosy" following the bland diet and having no gastric distress.

The following case is presented as illustrating the diagnostic value of gastroscopy in unexplained bleeding a year after gastric resection.

B E M G H No 278270, a thirty six year old married white American engineer entered the hospital for the seventh time December 25, 1933. Because of many severe hemorrhages from a duodenal ulcer a partial gastrectomy had been done by Dr A W Allen in 1932. After this operation the patient remained well for about a year. He then again passed several tarry stools. The bleeding at this time was moderate, blood being present in the stools for about a week. Gastroscopy revealed a shallow erosion one-half centimeter in diameter high up on the posterior wall. It was felt that the hemorrhage might well have come from this area and a diagnosis of postoperative erosive gastritis was made. After rest and dietary treatment the patient was discharged relieved.

Epigastric pain suggestive of peptic ulcer, but with negative x-ray studies, may be explained by gastritis. Without the aid of the gastroscope a diagnosis of gastric neurosis is not infrequently made in such patients. Later a definite peptic ulcer may be demonstrable by x-ray, as gastritis may be a forerunner or an accompaniment of ulcer. The following case is an interesting example of gastritis formerly diagnosed as possibly gastric neurosis.

A K, M G H No 326847 a forty five year old Lithuanian housewife, first entered the hospital January 26 1933, with a four months history of burn-

ing epigastric pain radiating to the back, coming usually two hours after eating, and relieved by soda and milk. There had been mild hematemesis and melena for about a week at the time of onset. Gastrointestinal x-ray on two occasions showed a 20 per cent 6 hour retention with spasm of the antrum, but the duodenal cap appeared normal. No positive diagnosis was made by x-ray. On a bland diet the patient did fairly well and was discharged with the clinical diagnosis ? peptic ulcer, ? psychoneurosis.

One year later she again entered the medical wards. She had not followed the bland diet prescribed and had continued to have epigastric discomfort and vomiting. Two more gastrointestinal x-rays had been negative, except that slightly enlarged rugae were found at one examination. The diagnosis was not clear. Gastroscopy at this time revealed a definite gastritis, the mucosa being red, denuded and edematous, with multiple elevations and depressions and some exudate. In some areas the appearance was so red as to suggest small submucous hemorrhages. On a rigid dietary schedule there was a marked improvement.

From the above cases and from numerous others, the value of the gastroscope in the diagnosis of gastritis is already evident. Gastrointestinal hemorrhage, unexplained by x-ray, may thus in many cases be traced to its origin by this method. Alcoholic gastritis, which has been observed only once in the present study may be seen and studied. Gastritis with or without peptic ulcer may be established as a positive diagnosis. Henning places gastroscopy first among the methods of making a positive diagnosis of gastritis, Schatzki*, formerly of Leipzig, and closely associated with Henning in his work on gastritis, likewise believes that the gastroscope is the ultimate means of diagnosis in gastritis.

PEPTIC ULCER

As an adjunct to the x-ray, gastroscopic examination is useful in describing and localizing ulcers of the stomach. Henning considers gastroscopy of particular value in judging the success of their healing. He also states that many cases will be observed where gastroscopy is more fruitful than x-ray.

Since the differential diagnosis of certain gastric ulcers and cancers is often impossible on gross examination after resection, it may be presumptuous to claim that such a differential diagnosis can be aided by gastroscopy, gastroscopy is, however, a study of the living mucous membrane, whereas pathology is only a study of the dead tissue. On this basis, Schindler² believes that such a differential diagnosis is sometimes possible, as cancer always shows at its base a very dirty brown or gray deposit, in contradistinction to the clean base of simple ulcer, moreover, cancer is usually irregular in shape with jagged borders, whereas ulcer is generally round with smooth margins. The following case tends to bear out the value of gastroscopy in such a differential diagnosis—

*Personal communication. Dr Richard Schatzki is now an Instructor in Roentgenology at the Harvard Medical School and working in the X Ray Department at the Massachusetts General Hospital.

F R. B M No 10739 a seventy five year old white American retired shoemaker first entered the hospital July 25 1933 complaining of sharp left upper quadrant and epigastric pain associated with vomiting Physical examination showed a man of 75 in very good condition There were no abnormalities noted except for a small right inguinal hernia Gastrointestinal examination done ten days before admission had shown a diverticulum about two centimeters in diameter in the lower third of the esophagus There was a constant ragged filling defect about two inches from the pylorus which had the characteristic appearance of cancer There was a 75 per cent gastric residue After admission to the hospital x ray of the stomach was repeated showing at this time an ulcerating lesion on the lesser curvature producing a deformity characteristic of benign ulcer although carcinoma could not be ruled out Gastric analysis showed a normal acidity thus favoring a diagnosis of ulcer Gastroscopy was then performed the gastroscope entering the stomach without difficulty The fluoroscope was used to guide the instrument past the esophageal diverticulum An ulcerating lesion about two and one half centimeters in diameter was seen on the lesser curvature about five centimeters proximal to the pylorus The base of this lesion appeared clean and the margins although slightly elevated were smooth Because of these findings and the age of the patient it was felt that operation should be delayed if possible Accordingly the patient was discharged home on July 29 feeling perfectly well on a rigid ulcer régime

Second admission August 20 1933 Two weeks after discharge the patient had a recurrence of pain and vomiting which became progressively worse and required hospitalization The gastrointestinal tract was again examined by x ray which showed the deformity previously described and was interpreted as being due either to benign ulcer or carcinoma Differential diagnosis by x ray was impossible Because of persistent obstructive symptoms operation was inevitable and was performed by the writer on August 23 A firm mass about six centimeters in diameter on the lesser curvature near the pylorus was found and resected anastomosis being accomplished by the anterior Polya method Pathological examination of many sections confirmed the gastroscopic impression that this was a benign ulcer Convalescence was uneventful and the patient was discharged home about two weeks after operation Three months later he was gaining in weight and strength and feeling perfectly well

Duodenal ulcer is not visible by gastroscopy A study of the nature and degree of the gastritis often associated with any peptic ulcer is however interesting and profitable It can hardly be doubted that many patients with typical ulcer symptoms but a negative x-ray may have a gastritis which may or may not be the forerunner of a definite peptic ulcer

Gastrojejunal ulcer should be visible by gastroscopy in certain cases but no case of that type has as yet been subjected to gastroscopic examination in this hospital A normal gastroenterostomy stoma is shown in figure 8

TUMOR

The diagnosis of neoplasm of the stomach is usually accurately established by x-ray By gastroscopy the examiner is able in most cases to confirm the diagnosis and sometimes aid in

the description localization and extent of the lesion Such confirmation has been established by gastroscopy in ten of the twelve cases of carcinoma examined (figs 9 and 10) The two cases of carcinoma in which gastroscopy failed were as follows first a small prepyloric lesion and secondly, a small adenomatous polyp of the



FIG 8 Normal gastroenterostomy stoma as seen by gastroscopy

greater curvature in the antrum which showed on pathological examination atypical proliferation As the gastroscopic lens looks to the side of the instrument and not along its axis a small lesion in that location may be missed

In one of the earliest gastroscopies performed at this hospital the examiner suspected a neoplasm near a gastroenterostomy stoma This

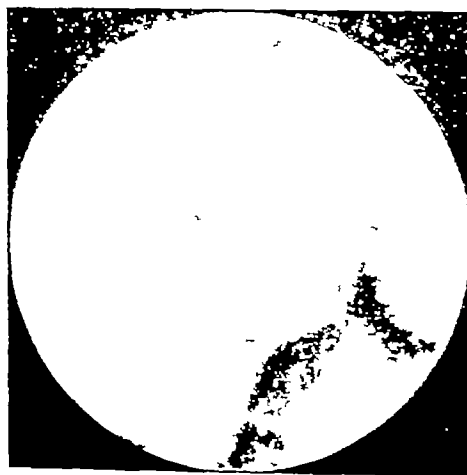


FIG 9 Appearance of ulcerating carcinoma as seen through the gastroscopy

in the face of a negative x-ray was subsequently confirmed at operation A brief summary of this case follows

J S M G H. No 329008 a forty nine year old married Polish janitor first entered the hospital July 21 1914 at which time a diagnosis of carcinoma of the stomach was made by x ray examina

tion, and gastric resection by the Billroth II method was performed by Dr C A Porter. Pathological report at that time showed adenocarcinoma.

Second Admission May 5, 1933. The patient had been well for nearly nineteen years until three months before this admission, when he began to have attacks of abdominal pain and constipation. X-ray examination of the gastrointestinal tract showed no disease of the stomach or duodenum, and barium enema was also negative. Gastroscopy was then performed, which showed on the margin of the stoma a round, elevated, whitish red area resembling a polyp or the margin of a malignant lesion.



FIG 10. Appearance of cauliflower carcinoma as seen through the gastroscopic

As this was one of the earliest gastroscopies done at this hospital, it was not possible to make a positive diagnosis. At operation, performed by Dr G A Leland, extensive carcinoma of the stomach was found, and a specimen removed for microscopic examination. Resection was impossible because of the extent of the growth. Pathological examination again showed adenocarcinoma. Whether this represents a recurrence of the original growth or the development of an entirely new lesion, it is impossible to say, but the nineteen year interval would seem to indicate that the present growth is a new one.

Benign tumors of the stomach are not very common and the x-ray diagnosis is usually quite accurate. According to various authors (Benedict and Allen⁸, Miller, Eliason, and Wright⁹), adenomatous polypi of the stomach probably become malignant in 35 to 40 per cent of the cases. Hence when such a tumor is discovered as an incidental finding, as occurred recently in this hospital, it is somewhat reassuring to know by gastroscopy that the tumor has the appearance shown in figure 11, and is therefore probably not as yet undergoing malignant degeneration. The patient referred to complained almost entirely of symptoms referable to the biliary tract, and, as her gall bladder has been removed, it will probably be necessary to explore the common bile duct. The tumor of the stomach should be removed later.

The endoscopic appearance of the gastric mucous membrane in pernicious anemia is of interest and will be studied further. In many cases the mucosa is smooth and pale, and blood vessels are clearly seen near the surface. In general the changes are those of marked atrophy.

In one case, later shown by exploratory laparotomy to be a carcinoma of the pancreas, the gastroscopic was helpful in confirming the x-ray



FIG 11. Gastroscopic appearance of probable adenomatous polyp referred to in the text.

opinion that no intrinsic gastric pathology was present.

SUMMARY

Gastroscopy has been carried out with the new Wolf-Schindler flexible gastroscope in 75 patients at the Massachusetts General Hospital, and has been shown to be an easy, harmless, and profitable procedure.

The greatest field of usefulness for the gastroscopic is probably in gastritis, but it is also useful as an adjunct to the x-ray in gastric ulcer and the various benign and malignant tumors of the stomach.

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FORCED GRASPING IN MAN AND ITS
LOCALIZING SIGNIFICANCE*

BY HENRY R. VIETS, M.D.†

1 INTRODUCTION The significance of unilateral forced grasping, in itself an uncommon clinical sign, has not been fully appreciated as a valuable aid in localizing cerebral lesions. In the case herewith reported the phenomenon was well-marked and served as a guide to the site of an obscure cerebral tumor. The presence of a cerebral cyst was discovered at operation in the area predicted from the neurological examination, the lesion was later verified by necropsy. In view of the importance of this sign in medicine, the literature is briefly reviewed and the details of the case published.

2 PHYSIOLOGICAL INVESTIGATIONS Forced grasping was first demonstrated experimentally by Richter and Hines^{14, 15}. They pointed out that a cortical lesion restricted to the premotor area ("Area 6" of Brodmann) of the frontal lobe in the monkey produced forced grasping of the opposite extremity. Later, Fulton, Jacobsen and Kennard⁷ by extirpation of the same area (monkey and chimpanzee), confirmed the findings of Richter and Hines, and, in addition, observed¹¹ spasticity and increased tendon reflexes. Bieber and Fulton² moreover demonstrated that the forced grasping varied in intensity with the animal's position in space. An additional fact was later noticed in that temperature changes could be observed in the contralateral extremities of animals when the premotor area was removed (Fulton and Kennard⁸, Kennard¹⁰). The complete syndrome of the premotor cortex has been discussed, both experimentally and clinically, by Kennard, Viets and Fulton¹², in their paper will be found a summary of the literature. The symptom complex consists of impairment of skilled movements, forced grasping, spasticity, and vasomotor disturbance.

3 CLINICAL REPORTS IN THE LITERATURE Beginning in 1903 and continuing intermittently ever since, reports have been published of patients showing forced grasping or more recently, the whole group of signs now called the syndrome of the premotor cortex. In all well-defined cases of reflex grasping other signs have been associated with this phenomenon, such as increase of the tendon reflexes, moderate spasticity, awkwardness or paresis of the extremity, and occasionally an extensor Babinski response. When pathological verification has been possible, the lesion has most often been in the posterior part of the frontal lobe, anterior to the motor area (Adie and Critchley¹), some authors found lesions, however, in the corpus

callosum (Walshe and Robertson¹⁷) and others in the basal ganglia. A patient showing the premotor syndrome, with the site of the lesion verified by operation, has recently been reported by Kennard, Viets and Fulton¹². In their patient, awkwardness, moderate spasticity and increase of tendon reflexes appeared precociously, prior to the onset of motor weakness. The forced grasping varied with changes of position of the body in space. Changes in skin temperature and sweating were noted. In varying degrees, moreover, the syndrome of the premotor cortex is illustrated in the following history.

4 CASE REPORT

Fred L. B., aged 55 (B. M. 12350) referred by Dr. W. D. Smith entered the Massachusetts General Hospital January 2, 1934 with a complaint of head ache and weakness of the left arm and leg. Six months before entrance the patient noticed a gradual numbness and "all gone" feeling in the left arm and leg which persisted until four months ago when definite weakness developed in these two extremities and in walking he began to drag the left foot. "Tonic contractions" of the left hand were also present. Three months after the onset, he gave up walking and only got from the bed to a chair.

He was carefully studied, three months after the onset in another hospital. The manifestations in the left hand were thought to be on a functional basis. Definite mental impairment was noted and increased reflexes in the left arm and leg. Roentgenograms taken at that time (October, 1933) showed the left sphenoid ridge indistinct and apparent erosion with some new bone formation about the middle third of the right petrous ridge, suggesting a meningioma around the acoustic nerve. To the roentgenologist the findings denoted two separate lesions. The initial pressure of the spinal fluid was 210 mm. of water and the total protein 55 mgm. per 100 cc. A diagnosis of a questionable cerebral thrombosis was made and the patient sent home for further observation.

Subsequently the patient developed diplopia with right external rectus palsy, generalized headache, a hissing noise in his head and well marked lethargy. His past history was unimportant, but the family history indicated repeated vascular disease on the maternal side and tuberculosis on the paternal.

Examination. When first seen (January 1934) six months after the onset of his illness he appeared very sluggish both mentally and physically. The nurse reported that he lay in bed for hours without moving or speaking. When spoken to he answered correctly but slowly in a good humored way. He appeared not to realize the seriousness of his illness and never volunteered any information about his symptoms. The left optic disc was hazy. On the right side the disc margins were obliterated and there was a hemorrhage along the course of the vessels near its margin. Neither disc was definitely choked. There was slight right external rectus palsy with drooping of the right upper lid and some bilateral nystagmus on lateral gaze. The left arm and leg were weak, but the patient could stand and walk alone the leg being held rigidly with the foot dragging. Both the arm and leg were slightly spastic and the tendon reflexes were

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greater on the left than on the right, particularly in the leg

The Left Extremities The left arm was slightly spastic, but this was by no means marked the tendon reflexes were slightly greater than on the right. There was no paralysis and all movements of arm and hand could be carried out voluntarily. The movements, however, were awkward, although there was no loss of position sense. This was difficult to judge on account of the patient's lethargy and uncertainty in answer. One felt certain of the awkwardness, nevertheless, especially in the performance of finer movements of the hands and fingers. A match box was picked up and held with considerable difficulty. The hand appeared normal both in color and contour, and no variation in temperature was noted when it was compared with its fellow.

The left leg was somewhat more spastic than the left arm. The knee-jerk and ankle jerk were very active although there was no patella or ankle clonus. The plantar reflex was easily elicited. At the beginning of the stroking stimulus the toes flexed strongly downward and the arch of the sole became more concave, as if the foot were grasping. Toward the close of the stimulus especially when the stroke was drawn across the ball of the foot the big toe turned upward and the small toes flared outward in a complete Babinski reflex. The initial part of the response with the tendency to grasp was not always present, being not nearly so constant as the Babinski phenomenon. Voluntary movement was slightly impaired in the leg particularly in the ankle and toes but all movements could be accomplished. No vasomotor or temperature changes were noted.

Forced Grasping When the left hand was examined marked grasping could easily be elicited by a variety of manoeuvres. If the hand lay open and relaxed stroking of the palm with stretching of the flexors caused immediate forceful contraction of the fingers and thumb so that the stimulating object was tightly grasped. Without further stimulation (i.e. moving the object grasped) the hand remained tightly closed for a few moments and then slowly relaxed to its former position. If however the object was moved in an attempt at withdrawal the fingers clutched all the more strongly and it was possible to lift the patient's shoulder and head from his bed by his left arm without the grip being loosened. Forced grasping was best evoked by inserting two fingers of the examiner's hand within the patient's palm especially if the approach was made from the side of the thumb and forefinger. Withdrawal between these two digits caused the most marked grasping and a much greater response was obtained by this method than by any other. Stimulation of the outer (ulnar) skin area of the palm evoked only a minimum response.

With the palm upward the patient could clench his fist either with the hand empty or over some object, easily and without delay. Likewise the hand could be opened at will. Touching the palm with cotton pinprick or pressure did not ordinarily evoke grasping if the patient's attention was diverted elsewhere. If however the examiner's fingers were within the range of vision of the patient groping movements could be stimulated by the approach of the fingers to the palm of the hand without making actual contact with the skin. When the patient's eyes were covered this did not occur and it was only when the flexor muscles were stretched that the grasp became definite.

Eye examination (Dr Tryge Gundersen) Vision was 20/30 in each eye. On the right there was edema of the upper half of the disc with a swelling of less than one diopter. The physiological cup was pre-

served, the veins were full and a hemorrhage was noted in the upper margin of the disc. The left fundus appeared normal. There was an internal squint on the right with some diplopia in all directions.

Laboratory notes The urine, blood and stools were normal. Spinal fluid initial pressure, 420 mm. of water dynamics, normal, cells, 2 lymphocytes and 2 polymorphonuclears total protein, 105 mgm per 100 cc colloidal gold 0000011211, sugar, 64.7 mgm per 100 cc chlorides, 708 mgm per 100 cc, Wassermann test, negative.

Roentgen-ray examination (Dr A. O. Hampton) There was moderate, diffuse convolitional atrophy, with the blood vessels on the right side more prominent than on the left. The wing of the left sphenoid was indistinct but appeared normal in the lateral stereoscopic films. There was slight asymmetry of the petrous ridges. The pineal shadow was somewhat to the left of the mid line. The roentgen-ray findings were not considered sufficiently characteristic to justify any diagnosis.

Summary of clinical findings The increased pressure in the spinal fluid with associated although slight changes in the optic discs made the diagnosis of brain tumor reasonably certain. The left hemiparesis pointed to a right cerebral lesion involving, at least in part, the motor cortex or its pathways. The roentgen-ray studies were distinctly confusing, especially the report from the previous hospital examination. Finally, after repeated study, the films were considered as not showing any definite abnormality except for the signs of general pressure. The grasping reflex in the left hand indicated that the lesion was probably in the right frontal lobe and exploration of the right frontoparietal area was advised.

Operation (Dr W. Jason Mixer) A large right osteoplastic flap was turned down. No evidence of neoplasm could be seen on the surface of the brain but exploration with a ventricular needle disclosed a cyst at a depth of four cm., about three cm. in front of the motor cortex. Ten cc of yellow fluid

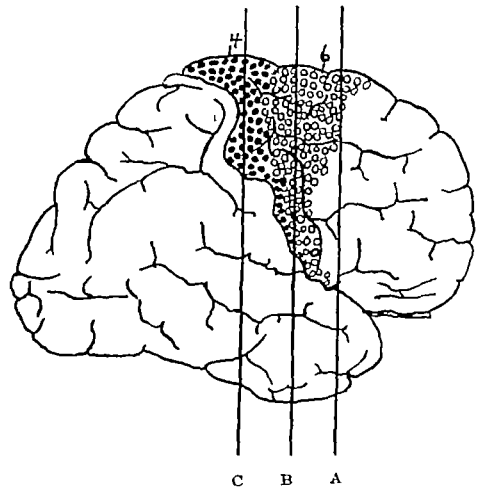


FIG 1 Right hemisphere showing limits of motor (area 4) and premotor (area 6) cortex with approximate levels of brain sections illustrated in fig. 2 (After Brodmann)

were evacuated (total protein, 3240 mgm per 100 cc.) The right ventricle was also tapped and some fluid removed (total protein, 160 mgm per 100 cc.) The ventricle did not appear to be enlarged.

The patient's general condition was poor and further exploration was not done. The patient died two days later without recovery of consciousness.

Autopsy The brain was cut in a number of frontal sections, three of which are shown in figure 2. The surface relation of these sections to the motor and premotor cortex are diagrammed in figure 1. The tumor lay deep in the right frontal lobe somewhat invading the left hemisphere by compression as well as by actually replacing tissue. Its limits were ill defined. The tumor could be seen in front of the tip of the right lateral ventricle not invading the knee of the corpus callosum. In a section more posteriorly (A figs 1 and 2) the tumor is more clearly visualized. It has pushed the corpus callosum downward and invaded its right lateral aspect slightly. The ventricles are distorted and the tumor has pushed the longitudinal fissure to the left. The caudate and lenticular nuclei with the internal capsule just showing between them are not invaded.

confirmatory of the work of others. The phenomenon described nevertheless, is not well known to workers in clinics or physicians in general practice. Some brief discussion of the subject appears to be indicated.

Forced grasping is usually easily elicited. It is best evoked in man by inserting two fingers into the palm between the thumb and forefinger. Attempts at withdrawal of the examiner's fingers brings out the maximum response. The reflex varies with posture, thus it is greatest when the patient lies on the opposite side and least when the patient is turned toward the affected hand. Fulton⁹ thinks that the grasp is

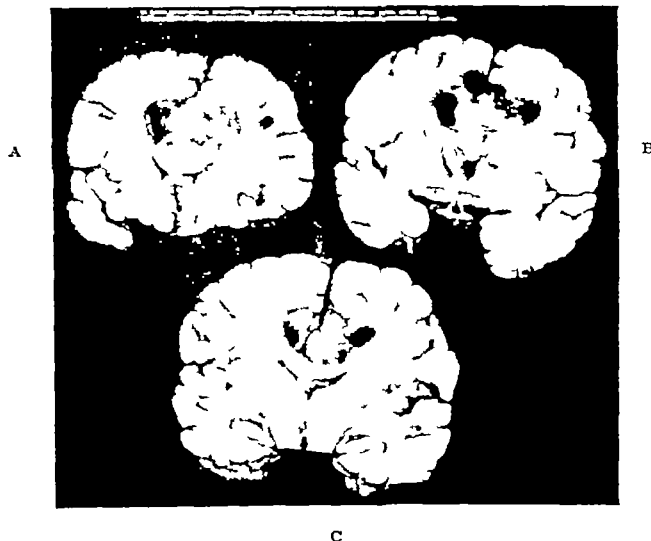


FIG 2 Brain sections showing general distribution of the tumor

Section B (figs 1 and 2) through the anterior commissure and the optic chiasm reveals the tumor at its maximum size. At this level the corpus callosum and the brain substance above it are replaced by tumor on the right and slightly on the left. The caudate nucleus and the internal capsule on the right, although compressed are not definitely involved. In section C (figs 1 and 2) showing the most posterior part of the tumor the lesion is again smaller, is limited almost entirely to the right side and to the right lateral part of the corpus callosum and the area directly above it. The internal capsule, thalamus and lenticular nucleus are not invaded.

In sections A and B the anterior and mesial parts of the corona radiata containing the projection pathways from the right premotor area going to the corpus callosum and to the most anterior parts of the internal capsule are replaced by tumor.

5 DISCUSSION The case reported above presented a striking picture of forced grasping and confirmed much that was already known about the clinical sign. Pathological study moreover indicated the localization of the lesion in the region of the projection fibres of the premotor area, a point already proved by experimental investigation and suggested by other clinical cases. The value of this report therefore is mainly

part of the righting reflex mechanism and that it follows other body-righting reflexes. It usually appears late in clinical cases and is associated with the other signs of the premotor syndrome.¹² In the patient described here, forced grasping was the only part of the syndrome to be prominently displayed. Experimentally it has been shown that forced grasping may manifest itself in complete absence of the sensory innervation of the affected extremity³, but this has not been demonstrated in man. That forced grasping is associated with lesions of the premotor cortex cannot be doubted. When it occurs bilaterally, the sign has less localizing value. Bucy⁴ has shown that in the presence of marked internal hydrocephalus with increased intracranial tension due to tumors present in other locations than the frontal lobes the reflex may be observed in both hands and is thus of questionable value as a localizing sign.

The *histology of the premotor area* was first clearly described by Campbell⁶, who pointed out that this is a specialized region, without large Betz cells but containing a great number of small and medium sized cells. He concluded

that these cells were motor in function and were the origin of a cortical projection system. Schuster and Casper¹⁶ have traced these fibres into the anterior end of the internal capsule, a large group cross through the corpus callosum to the opposite side⁸

The functions of the premotor area have been extensively studied, mostly, however, in animals, since Campbell's⁶ original idea that the region was one of the chief centers for the integration of complex skilled movements. Adie and Critchley¹, Brain and Curran⁵ and others have concluded that the region exerts an inhibitory action on such postural reflexes as the grasping phenomenon. When the area is destroyed, either by animal experimentation or by a pathological lesion in man, the primitive (thalamic level) reaction is exhibited, in part, at least, through the pyramidal pathway. Fulton and Kennard⁸, however, have shown that the premotor area may function in animals after the pyramidal tract is severed and thus the efferent impulses from this area may be said to pass downward over an "extra-pyramidal" pathway, some going to the ipsilateral extremity⁵. It is known, anatomically, that the cells in the premotor area have connections with the caudate nucleus, the red nucleus, the substantia nigra and other "motor" structures. Thus it seems reasonable to assume that all these structures have somewhat related functions and that they may be correctly referred to as "extrapyramidal" units.

Spasticity after unilateral lesions in the premotor area is a striking, although often a transient, feature in the higher apes¹¹. From the experimental data it seems clear that spasticity is only seen after a disturbance of area 6. Interruption of the pyramidal tract (area 4) does not in itself cause it, resulting always in flaccidity^{9a}. Combined lesions of area 4 and area 6 give a permanent spasticity, as is so often the case in a capsular hemorrhage resulting in hemiplegia. In cases with lesions in area 6 alone, there may be some increased resistance to passive manipulation, as was noted in the patient reported by Kennard, Viets and Fulton¹². The deep reflexes are increased, especially those associated with the digits (Hoffmann's sign). If the Babinski reflex is present, lateral deviation of the toes is likely to be a prominent part of the response.

Although some of the fibres from the premotor area cross to the opposite side in the corpus callosum, section of this structure in monkeys produces no motor weakness and does not cause forced grasping. Kennard and Watts¹³

observed, however, a syndrome characterized by inertia and slowness in initiating purposeful movements, both of which have been noted in man as part of the syndrome of the premotor cortex.

6 CONCLUSIONS A lesion of the frontal lobe in man, so situated that it interferes with the projection pathways from the premotor area, gives rise to forced grasping in the opposite hand.

The corpus callosum is usually involved in the lesion, but there is experimental evidence that forced grasping itself is not associated with destruction of this structure.

The anterior part of the cortico-spinal pathway and an "extra-pyramidal" unit carry the projection fibres from the premotor cortex.

Unilateral forced grasping indicates a lesion of the opposite premotor cortex or the pathways descending from it.

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DISLOCATION OF THE SHOULDER—AN END-RESULT STUDY

BY HORATIO ROGERS, M.D.*

DURING the past seven years 74 cases of shoulder dislocation were treated at the Massachusetts General Hospital. Of them only 9 were hospitalized, usually because of some concurrent injury. The other 63 cases were treated in the Emergency Ward and allowed to go home the same or the following day. An attempt to learn the end-results of these cases resulted in 19 patients returning for examination

the types of dislocation is confined to the group of 33 end-resulted cases. In table 1 this group is further divided into 11 fracture-dislocations, 5 old dislocations (that is, dislocations at least 1 week old on admission), 4 recurrent dislocations, and 13 single acute dislocations. The term recurrent dislocation is used to mean repeated dislocations occurring either before or after admission to the hospital.

TABLE 1
TYPE OF DISLOCATION IN 33 SHOULDER DISLOCATIONS

	Ant.	Post.	Subglenoid	Unknown	Total
Fracture-dislocations	6	0	4	1	11
Old dislocations	5	0	0	0	5
Recurrent dislocations	1	1	0	2	4
Single acute dislocations	8	1	0	4	13
Total	20	2	4	7	33

and 13 replying to a rather extensive questionnaire. Thus, although certain data may be based on 74 cases, the end-result study is limited to a series of 33.

The 74 cases of shoulder dislocation represent about 2 per cent of all the fractures and dislocations treated during the same period. The age incidence was not characteristic except that none occurred under 10 years of age and all but 12 per cent were between 20 and 70 years old.

As would be expected, there is a great preponderance of anterior dislocations. The high incidence of subglenoid positions among the fracture-dislocations is of interest, suggesting that the head of the humerus may tend to be less widely displaced when some of the dislocating force is spent in producing a fracture.

Before discussing end-results some definition of terms is necessary. End-result here means a result noted long enough after injury, usually

TABLE 2
FRACTURE-DISLOCATIONS OF THE SHOULDER
11 CASES

Case	Delay before reduction	Reduction	Complete disability from time of injury	End Result
1	5 weeks	Resection head of humerus	9 months+	A ₁ F ₁ E ₁
2	15 weeks	Operative	6 months+	A ₁ F ₁ E ₁
3	12 weeks	None operation refused	15 months+	Died 15 months
4	None	Closed no anesthesia	Unknown	Died 7 months
5	None	Closed ether	1 month	A ₁ F ₁ E ₁
6	None	Closed ether	1 month	A ₁ F ₁ E ₁
7	None	Closed gas	3 weeks	A ₁ F ₁ E ₁
8	None	Closed ether	2 months	A ₁ F ₁ E ₁
9	None	Closed gas	3 months	F ₁ E ₁
10	None	Closed gas	7 weeks	F ₁ E ₁
11	None	Closed	Unknown	F ₁ E ₁

The right and left shoulders were affected the same number of times. There were 48 males and 26 females, a male predominance of about 2 to 1.

Because of the incomplete data available in some of the untraced cases, a consideration of

one year so that further improvement or impairment will be unlikely to occur. The result in each case is graded from the anatomic, functional, and economic point of view on a basis of 4. Thus a grade of 1 would mean anything from 0 to 25 per cent, 2 from 25 per cent to 50 per cent, etc. It should be noted that 4 does not necessarily mean perfection but includes everything from 75 per cent to 100 per cent. In

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the present series, the omission of an anatomic grade usually means that no late x-ray was available, but this is not considered of so great importance as the functional result, since motion is the chief criterion of usefulness in the shoulder joint. The economic result refers only to a comparison of earning power before and after the dislocation.

Eight of these cases were hospitalized, and all received the careful after-care habitually employed in cases of fracture. The most striking

function. Of the other four, although closed reduction was possible in each case and the immediate disability was not unduly prolonged, only two got satisfactory results.

The hospital visit made by each of these patients represents merely an incident in a chain of dislocations, most of which are reduced by the patient himself. Table 4 shows the extraordinary facility with which the humeral head passes in and out of the capsule with very little pain, disability, or loss of time from work.

TABLE 3
SIMPLE SINGLE DISLOCATIONS WITH DELAY IN TREATMENT
5 CASES

Case	Delay before reduction	Reduction	Complete disability from time of injury	Functional end result	Present complaints
12	13 weeks	Operative	6 months	F ₂	Limited motion
13	1 week	Closed, no anesthesia	3 weeks	F ₂	Painful shoulder
14	4 weeks	Closed, ether	2 3 weeks	F ₂	None
15	1 week	Closed, ether	2 months	F ₂	Weak, limited, painful
16	2 weeks	Closed, ether	1 month	F ₂	None

thing in table 2 is the bad results obtained in the three first cases, all apparently due to delay in reduction, although it is only fair to state that in case 1 the dislocation was complicated by a transverse fracture of the surgical neck of the humerus which would have presented an extremely difficult problem even if seen early. A further study of table 2 shows that all of the immediate reductions and none of the late reductions were rated F₄. All of the immediate reductions were accomplished by closed manipulation, while in the late group every effort at closed reduction failed. In the immediate reductions the average length of disability was

Since no operative treatment was attempted, none of these patients were hospitalized. The end-results in this particular group are really not end-results of treatment at all, but merely show the present status of essentially untreated conditions.

The remaining 13 dislocations were all reduced within 24 hours of their occurrence, and were discharged at once. More than half of them were bandaged two weeks or less. The average time lost from work was 8.5 weeks. It is in this group that we would naturally expect to find the best results, it will be seen from table

TABLE 4
RECURRENT DISLOCATIONS
4 CASES

Case	Times before admission	Times after discharge	Reduction	Bandaged	Work lost	Pain	Functional end result
17	10+	8+	Closed, ether	1 day	None	1 day	F ₂
18	2	2	Closed, no anesthesia	7 days	10 days	2 days	F ₂
19	3	None	Closed, no anesthesia	3 days	None	14 days	F ₂
20	None	5	Closed, no anesthesia	21 days	2 days	3 days	F ₂

15 months as compared with 10 months in the late cases. This group strongly suggests the ill effects of delayed treatment.

To visualize the effect of delayed treatment in uncomplicated dislocations, the five cases in which delay occurred are shown together in table 3. Only case No. 12 was hospitalized, the rest being discharged within 24 hours after reduction. Case No. 12 required operative reduction, underwent six months of complete disability, and has a permanent impairment of

5, however, that about one-third of them got poor or bad functional results. So far as is known, none of these 13 patients received any medical after-care.

This group probably should contain also most of the 39 untraced cases previously mentioned. The traced cases would never have been heard from unless they had been urged to return for the purpose of this study, yet a third of them were found to have poor functional results. Therefore we cannot assume that because cases

are not heard from they must have done well. It is more reasonable to suppose that the results in the untraced group were just as poor as those shown in table 5.

It will be seen at once from table 6 that of the total series, of course omitting the two deaths, only 58 per cent got a good functional

SUMMARY AND CONCLUSIONS

The poor functional end-results in this series of 33 shoulder dislocations seem to have been chiefly due to delay in reduction and insufficient after-care.

The delay cannot always be avoided, but we must realize that every hour of delay is produc-

TABLE 5
SIMPLE SINGLE DISLOCATIONS WITH IMMEDIATE REDUCTION
13 CASES

Case	Anes	Bandaged	Lost work	Pain	Complete recovery	Functional end result	Present complaints
21	Gas	10 days	10 weeks	1 year	Never	F ₁	Limited painful
22					Never	F ₁	Painful
23	Ether	2 weeks	24 weeks		Never	F ₁	Weak limited
24	Gas	3 weeks	12 weeks		Never	F ₁	Weak, painful
25	None	4 weeks	None	1 week	4 months	F ₁	None
26	None	1 week	1 week			F ₁	None
27	None	3 months	16 weeks	3 months	4 months	F ₁	None
28	None	5 months?				F ₁	None
29	None	4 weeks	4 weeks	3 months	3 months	F ₁	Occ. slt. pain
30	Ether					F ₁	None
31	Ether	2 weeks	7 weeks	None	1 year	F ₁	None
32	Ether	6 weeks	10 weeks	1 year	1 year	F ₁	None
33	Ether	1 week	2 weeks	2 months	2 months	F ₁	None

end-result, while 42 per cent got a poor or bad functional end-result. Note that the highest proportion of good results came in the fracture-dislocation group, better by 18 per cent than those in the simple non-recurrent group with immediate reduction. The only reasonable explanation is that the group deemed to have the

ing further injury to the joint and making less likely a good ultimate functional result.

The conception of simple dislocation of the shoulder as a trivial injury is undoubtedly wrong. In order to obtain a high percentage of good late results, the dislocation must be reduced early, and the patient must be kept un-

TABLE 6
RÉSUMÉ OF FUNCTIONAL END-RESULTS
33 CASES

End result	Fracture-dislocation 11 cases	Simple dislocation with delayed reduction 5 cases	Simple recurrent dislocation 4 cases	Simple non recurrent dislocation with immediate reduction 13 cases	Total
F ₁	88% (7)	40% (2)	0	70% (9)	58% (18)
F ₂	6% (1)	60% (3)	75% (3)	15% (2)	29% (9)
F ₃	6% (1)	0	25% (1)	15% (2)	13% (4)
F ₄	0	0	0	0	0
Died	(2 cases)	0	0	0	(2 cases)

more serious injury received the more thorough care. It would appear from these figures that uncomplicated shoulder dislocation even with the most favorable immediate treatment is not a trivial injury from the point of view of ultimate function.

der observation not only long enough to detect any possible complications which may have been masked by the dislocation itself, but also to insure a gradual return to full function by graded exercises. Three months is certainly not too long to keep even simple cases under observation.

THE USE OF AUTOGENOUS URINARY "PROTEOSE" IN AN ALLERGIC CONDITION

BY PURCELL G. SCHUBE, M.D.*

IN 1929 Oriel¹ reported the presence of a substance which he called "proteose", in the urine of allergic and other individuals. Later² he felt that this material contained a specific antigen to which the patient was sensitive and has attempted to substantiate his claim by means of animal experimentation, skin reactions, and also by treating allergic patients with it. This latter he did by preparing a very dilute suspension of the "proteose" and injecting it into the individual from whom it had been removed, gradually adjusting the dosage until relief from the allergic condition was obtained. Since Oriel first reported his work on this substance he, as well as others, have made experimental observations upon it. At the present time the reports of value on this method of therapy are very controversial.

It is the purpose of this paper to present a case study of an allergic individual in whom autogenous urinary "proteose" was used with very satisfactory results.

METHOD OF PREPARATION OF URINARY "PROTEOSE"

Under as aseptic conditions as possible 1,000 cc of urine was collected from the patient into a sterile bottle into which 1 cc of CP chloroform had been added as a preservative. Four hundred cc of this specimen was made acid to Congo red (pH₃) with dilute sulphuric acid. This acidified urine was then shaken with 100 cc of CP ether in a separating funnel. After the mixture had stood for a period and separated into two layers, the lower layer was run off and discarded. To the remaining layer small amounts of absolute alcohol were added with constant shaking until 100 cc had been used. The resulting precipitate was drawn off into a centrifuge tube, washed with absolute alcohol and centrifuged down. This washing procedure was repeated three times. The fluid above the precipitate was poured off and the precipitate suspended in sufficient N/10 NaOH to make it alkaline. Then it was transferred to a vaccine bottle and made up to 10 cc with Locke's solution. This suspension was called a 1:1,000 dilution. From this stock bottle the required dilutions were made. All of the dilutions, when not in use, were kept at 20°C.

CASE REPORT—Complaint. A white male aged 35 years was admitted to the hospital in July, 1932, complaining of large areas of urticaria and wheals of eight and one-half years duration, obesity, insomnia, irritability, and depression. Family history. There was no history of allergic phenomena

or mental disease in the immediate family or in any of the collateral branches. The patient had been married. His wife died, while the patient was under treatment, of sarcoma of her left hip. There were two children, both living and well. Past History. The birth and early development of the patient was normal. As a child he had measles, mumps, and chickenpox. At the age of four years he had an abscess of his ear which persisted for two years and was finally "removed surgically". At the age of nine years he was hospitalized for one month for "cerebral pneumonia" which was later thought to have been influenza. Lumbar punctures at that time were entirely negative. At the age of 20 years he had an infected inguinal gland removed. At 27 years of age the patient had an attack of malaria. He made an uneventful recovery. His school history was entirely uneventful. His intellectual and social activities were considered normal. His personality was that of an extroverted individual. His marital activities were adequate and uneventful. Present Illness. In 1924 while in Panama, the patient had a tooth extracted from an area in his mouth into which novocaine had been injected. About two hours afterwards he had a severe attack of urticaria. There were wheals involving the entire surface of the back, chest face, arms, legs, scrotum and penis. They itched and burned, and later, in places, exuded a serous fluid. The wheals were definitely raised and clearly defined. This condition persisted and became so annoying that he came back to the United States for hospital treatment. He had skin and other tests all of which were negative excepting that from his seminal fluid. This gave a positive reaction. Desensitization was not possible. Adrenalin, ephedrine, blood serum, thyroid extract, physiotherapy and hydrotherapy gave only temporary relief. About this time the wheals although not so bad as before became very large and painful. They were definitely aggravated by exercise or physical labor. There was a gradual thickening of the cutaneous tissues and during the following four years the patient gained 84 pounds. As this condition continued to exist with no remission the patient became irritable, quarrelsome and easily upset. Later he also became indisposed and indifferent, morbid and depressed. His movements became progressively more sluggish and lethargic. He was unable to sleep. Because of this he was admitted to the hospital. Physical examination. The patient was a white male, aged 35 years. He was of pyknic body habitus 5 feet 5 inches tall, and weighed 230 pounds. His skin felt tense and scattered over it were large thickened wheals, some round and ranging in size from a quarter to a saucer and raised from 1/16 inch to 1/2 inch in height. Some were seriginous and of the same height. The wheals were reddened, moist, and exuded a serous fluid when irritated. They were hard and painful and blanched on pressure. They were distributed over the entire body excepting the visible mucous membranes. The fatty tissues were evenly increased over the entire body. Muscle tone was increased. Bone structure was normal. Eyes, ears, nose and throat were entirely negative. Sinuses and mastoids were negative. The heart and lungs were normal. The abdomen was negative. The genitalia were negative. The rectum and prostate were normal. The extremities were normal. All reflexes were hyperactive. The plantar response was normal. There was no ataxia in Romberg position. Laboratory findings. Urine—sp

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gr 1015, alkaline, no sugar no albumin, no casts
Ether reaction positive Blood urea nitrogen 16
mgm per 100 cc, non protein nitrogen 30 mgm per
100 cc, sugar 92 mgm. per 100 cc Wassermann neg
ative Spinal fluid—pressure (air) 80 mm, cells 3
sugar 50 mgm per 100 cc, protein 35 mgm per 100
cc., Wassermann negative, colloidal gold curve neg
ative

Progress Inasmuch as the patient was suffering
from his urticaria and had obtained no permanent
relief from other types of therapy it was decided to
attempt to desensitize him with injections of autog
enous urinary proteose This substance was pre
pared from his urine The skin tests were strongly
positive. The subcutaneous injection of autogenous
proteose was started using a 0.1 cc of 1:1000000
dilution. This was increased 0.1 cc. daily until
1:10000 dilution was reached During a period of
about four months he showed progressive improve
ment in his allergic condition he lost 26 pounds
felt better lost much of his sluggish and irritable
feeling became less depressed and was able to
sleep quite well When the dosage of 0.1 cc of
1:10000 dilution was reached, he exhibited a hyper
sensitiveness which was manifested by a return of a
few small itching wheals on his wrists and abdom
en. The dosage was dropped back to 1:100000
and gradually increased at the former rate When
the 0.1 cc of 1:10000 dilution was reached he again
showed the same reaction. It was decided to keep
him on 1:100000 dilutions This was done for one
month and then gradually discontinued by increas
ing the time interval of the injection For about four
months he was entirely free of his urticaria and
during this period he had no treatment. At the end
of this period his wife who was suffering from sar
coma of the left hip died suddenly The following
day his urticaria returned Again he was started
on proteose—0.1 cc of a 1:1000000 dilution In one
week his urticaria showed marked improvement and
in two weeks had disappeared Much of the grief
which he had shown at the death of his wife had
disappeared by this time The proteose was rapid
ly stepped up in dosage until 1 cc of 1:100000 di
lution was reached Again the proteose was gradu
ally discontinued as before Since the discontin
uance of the proteose a period of seven months
has lapsed during which the patient has been free
from any allergic phenomena and has lost 30 pounds
more His mental condition which during his al
lergic state was one of depression has returned to
normal

DISCUSSION

Oriel and Barber³ and later Knott, Oriel and
Witts⁴ feel that they possess sufficient proof
that the autogenous urinary "proteose" con
tains the specific complex of one or more anti
gens to which the allergic patient is sensitive
Thus proof is that (1) an allergic patient gives,
in a large number of cases, a positive skin reac
tion to his own urinary proteose by dermal in
tradermal and patch tests, (2) this sensitivity
can be transferred to a normal individual by the
injection of a sensitized patient's serum, a posi

tive Prausnitz-Küstner reaction being obtained
when a dilute solution of urinary "proteose"
of the allergic patient is subsequently injected,
(3) the "proteose" obtained from a patient suf
fering from serum sickness gives a positive re
action when injected in very small quantities into
a known "horse-asthmatic" and one patient with
horse-asthma will react to the "proteose" from
another patient with horse asthma, (4) a spe
cific antigen from milk or egg can be identified
in the urinary "proteose" of milk-sensitive or
egg-sensitive patients, (5) there is the produc
tion by the liver of a fresh substance (secondary
antigen) from the original antigen, (6) in spe
cific food sensitization it has been possible to
sensitize guinea-pigs actively by using the uri
nary nitrogenous substance from that patient as
the sensitizing dose, and (7) the specificity of
urinary "proteose" finally is confirmed by
marked exacerbations of the original lesions and
symptoms if excessive dosage was used

However since the introduction of urinary
"proteose" for the treatment of allergic con
ditions by Oriel it has except in a few instances,
been received very conservatively, and the clini
cal and experimental work reported have, in
addition to being very contradictory and incom
plete been rather hasty in condemning it as
useless It is to be expected that the method
employed will not produce one hundred per
cent of cures or even of reliefs from allergy
But even though it aids only a few allergic cases
which are benefited by no other method of ther
apy it is of value and worthy of use It is felt
that the presentation of this case in which no
other method of therapy was of any avail, and
in which definite and sustained relief was ob
tained by the use of autogenous urinary "pro
teose" is adequate proof of the value of trying
this method of therapy in cases of allergy

SUMMARY

A case of allergy is presented in which very
good results were obtained by the use of autog
enous urinary "proteose"

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a substance of a proteose nature in the urine in certain
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(Oct.) 1930

AN EXPERIMENTAL PROCEDURE DESIGNED TO OVERCOME TUBAL STERILITY

BY EDWARD A. HERR, M.D.*

STERILITY in the female, for generations past, has been the cause of considerable perplexity, much research work and the devising of many new operations for its elimination.

We will not discuss here, the correction of the many causes of sterility or infertility, such as hyperacidity of vaginal secretions, mucus plugs, stricture of vagina or cervix, endocervicitis, displacements or malformations of the uterus, tumors, ovaritis, syphilis or defective female sex hormone activity, as each cause has its own appropriate method of treatment.

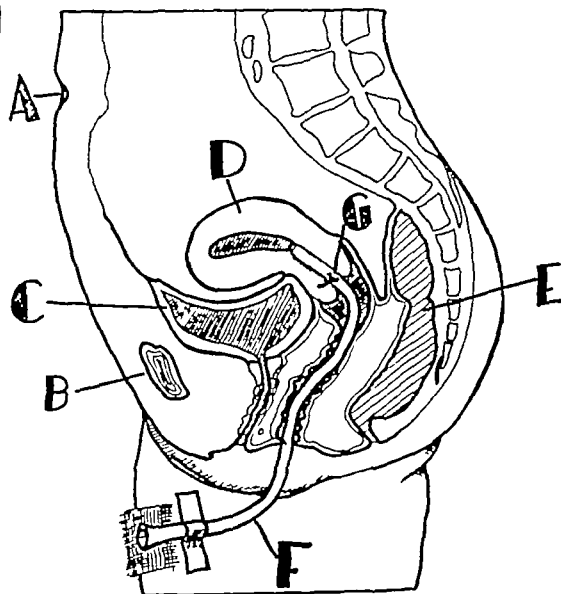
For the correction, however, of the tubal type which has resulted from occlusion of both tubes from any cause, much difficulty and uncertainty have been encountered. With the former methods of opening occluded tubes whether by filiforms, Rubin's insufflation method or the injection of lipidol, there has been no assurance, that after having opened the tubes, they would remain patent for any appreciable length of time.

As my past experience, with the above mentioned methods, has not been satisfactory, I have arrived at the conclusion that any method that does not insure patency of the tubes for a definite period, at least ten to fourteen days, is most likely to result in reclosure of the tubes. This led me to attempt a method of maintaining the patency of the affected tubes for a definite length of time with certainty.

The typical case in which the operation is particularly applicable is one in which the patient has been married for several years and has never been pregnant. A uterotubogram is done as a check-up to prove that the uterus is well filled and both tubes are completely occluded and no spill of lipidol is evidenced in the peritoneal cavity.

OPERATION Under general anesthesia a dilatation and curettage is performed, particular stress must be laid on a careful and complete dilatation. A large sized rubber catheter (size 24) is introduced into the uterine cavity, care being taken that it has passed the internal os, and is then anchored to the cervix with one catgut suture. The catheter must be long enough to extend well out of the vulva. The distal end is fixed to the thigh with a strip of adhesive. The vulva is covered with sterile gauze.

Through a low median incision, the peritoneal cavity is now entered. The uterus is lifted into view with a uterine elevator and the tubes examined and freed of adhesions. The fimbriated end of one tube is held with thumb forceps and the tip of a 20 cc Luer's syringe inserted. A catgut ligature may be tied around the tip of the syringe over the fimbriated end of the tube to prevent leakage, if necessary. The tube is now dilated under forced air pressure until air is heard entering the uterus. The dilatation



DESCRIPTION OF FIGURE 1

- A Umbilicus
- B Symphysis pubis
- C Bladder
- D Uterus
- E Rectum
- F Large rubber catheter No. 24 anchored to cervix and extending through internal os uteri
- G Anchor suture of tube in cervix.

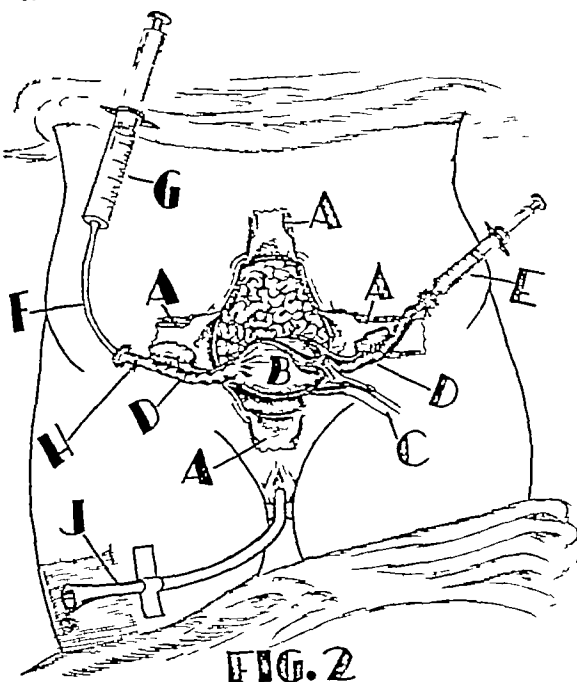
of the tube is readily visible as the forced air pressure progresses along the calibre of the tube toward the cornu. After removing the syringe, a small sized infant catheter is inserted 2 cm into the fimbriated end of the tube and tacked with a no. 00 catgut suture. The same process is repeated on the other tube. Stab wounds are made through the abdominal wall and the catheters are brought out extra-abdominally at locations opposite the normal positions of the fimbriated ends of the Fallopian tubes. The catheters are anchored to the skin with catgut sutures, care being exercised to avoid undue tension.

A one per cent mercurochrome solution is forced into the catheters, through the Fallopian

*Herr, Edward A.—Gynecologist—St. Mary's Hospital, Waterbury, Connecticut. For record and address of author see This Week's Issue, page 709.

tubes, into the uterine cavity and appears at the mouth of the large cervical catheter extending from the vulva and attached to the thigh, thereby demonstrating the patency of the tubes. The abdomen is now closed. Gauze dressings are applied in such a way that future instillations of mercurochrome might be made without taking down the abdominal dressings. This completes the operation.

D. Edward A. Herr
Experimental Procedure Described
in "Gynecology" - 1915, Vol. 1, p. 150.



DESCRIPTION OF FIGURE 2

- A. Self retaining retractor
- B. Corpus uteri.
- C. Gauze dressing
- D. Fallopian tube.
- E. Syringe injecting air and dilating Fallopian tube
- F. Small rubber catheter anchored in Fallopian tube
- G. Syringe injecting mercurochrome (or methylene blue) into small rubber catheter connecting with Fallopian tube
- H. Anchor suture in Fallopian tube.
- J. Large rubber catheter attached to thigh

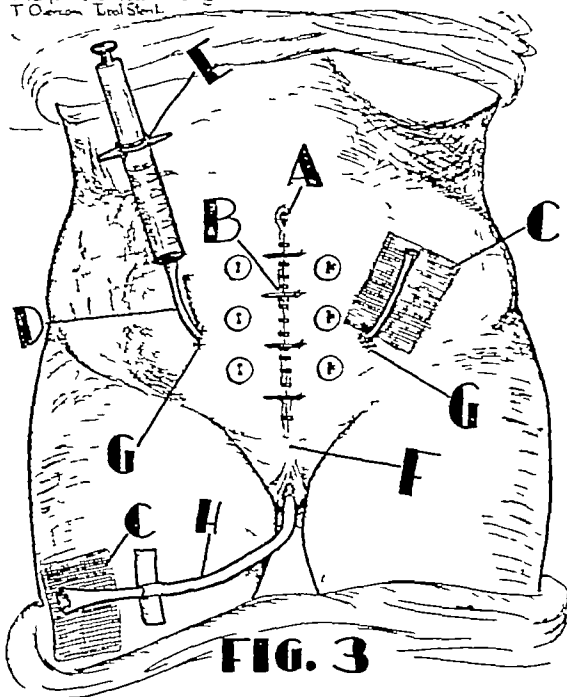
The after-treatment consists of alternating daily instillations of the abdominal catheters with mercurochrome solution and sterile olive oil. The olive oil is used on alternating days for the purpose of acting as a lubricant to prevent irritation of the epithelial mucosa of the Fallopian tubes and avoid adhesions and recurrence of occlusion. On the tenth day the cervical tube is withdrawn and on the fourteenth day the abdominal tubes are removed. As a check-up, for patency of the tubes, a uterotubogram is taken one month after the operation.

The technic of the operation is applicable to all cases in which both tubes are found to respond to the insufflation air method, as de-

scribed, with a Luer's syringe. In these cases it will be observed, as the air enters the fimbriated end, the Fallopian tube visibly dilates and the progress of the dilatation can be followed along the tube until the rush of air is audible in the uterus. This is followed by the injection of mercurochrome, which is a reasonable demonstration that the patency test is positive. Where both tubes respond to this procedure, we have the ideal case for the operation, which after having been successfully performed, justifies us in feeling that the cause of sterility, due to occlusion of the tubes, has been overcome.

However, after opening the abdomen and attempting the insufflation test of the tubes, it may be found that either one or both tubes may not respond to the test, owing to atrophy or sealing of the lumen of the tubes due to pre-

D. Edward A. Herr
Experimental Procedure Described
in "Gynecology" - 1915, Vol. 1, p. 150.



DESCRIPTION OF FIGURE 3

- A. Umbilicus
- B. Abdominal incision.
- C. Gauze dressing
- D. Small rubber catheter from right fimbria
- E. Syringe for daily injection
- F. Symphysis pubis
- G. Puncture wound for small catheter
- H. Large rubber catheter sutured to cervix.

vious inflammation. If one tube responds to the test, it may be considered, as a case for the operation, as one patent tube is all that is necessary to transmit the ovum to the uterus for pregnancy.

In extreme cases it may be found impossible to dilate either tube under air pressure or to

force mercurochrome solution into the uterus. In such cases careful inspection of both tubes will elicit the fact that the occlusion of the tubes frequently occurs distally to the uterine cornu. There is a section, close to the uterine cornu, where the tube or tubes will be found normal. In such cases access into the lumen of the tube may be gained by a small puncture incision in the vicinity of the cornu of the uterus into which the tip of the infant catheter is inserted and the after-treatment instituted in the same manner as when the infant catheter is sutured into the fimbriated end of the Fallopian tube.

In three cases in which I have performed this operation, hysterosalpingography preoperatively showed both tubes in each patient completely occluded and a positive diagnosis of complete sterility was made. The technic of the operation as described was used successfully and one case cooperated with the follow-up of the uterotubogram. A lipiodol injection, three months postoperative of this case, showed a normal filling of the lumina of both tubes with a moderate amount of spill in the peritoneal cavity in the region of both the right and left fimbriae.

CONCLUSIONS (1) A new operation for sterility has been devised, (2) the series of cases is too short to draw final deductions and is offered as a preliminary report, (3) in one case in which the operation was used the tubes remained patent for three months.

PERSONAL HISTORY

CASE No 1

Name Mrs L C
Case No 2670 Date 5 8 33 Dr Edward A. Herr

Final diagnosis To be recorded when determined—Sterility Left salpingectomy Right tubal occlusion.

Age 42 Sex F Race W S M W yrs
Divorced Adm 4-16 Dis 4 17 32 Occupation
Factory employee

Family History Age—Health, if living, or cause of death—Note especially hereditary or infectious diseases

Father 42 Died nephritis
Mother 52 Cardiac disease cause of death.
Brothers None
Sisters 2 Both living and well

December 6, 1923 Left tubal ectopic pregnancy. Operation left salpingectomy Dr Edward J Godfrey, St. Mary's Hospital

January 2, 1926 Has never been pregnant aside from ectopic. Question of sterility

January 3 1926 My office Rubins insufflation (oxygen test) negative Diagnosis Sterility, occlusion right tube

January 12, 1926 'Sterility operation' on right tube Dr Edward A. Herr, St. Mary's Hospital

December, 1926 Divorced

April 5, 1932 Office consultation regarding sterility. Desires to marry again and wishes to bear children

April 16, 1932 Uterotubogram, St Mary's Hospi

tal Right tube patent and spill visible in peritoneal cavity

April 17, 1932 Uterotubogram Right tube patent but not visible, marked evidence of lipiodol in right pelvic peritoneal cavity Left pelvic peritoneal cavity no evidence of lipiodol

April 20, 1932 Diagnosis, the uterus and right tube are patent.

May 5, 1933 Follow-up Patient has not married on account of financial depression Will not consent to uterotubogram for same reasons

Conclusions Tube patent six years postoperative.

Signed EDWARD A. HERR.

PERSONAL HISTORY

CASE No 2

Name Mrs A. P
Case No 1680 Date 5 8 33 Dr Edward A. Herr

Final diagnosis To be recorded when determined—Sterility Occlusion both tubes

Age 25 Sex F Race W M yrs 6 Adm
3 28 Dis 4-12 32 Occupation Housewife

March 20, 1932 History Married six years, never pregnant.

March 23, 1932 Uterotubogram, both tubes occluded Diagnosis Sterility

March 29, 1932 "Sterility operation" By Dr Edward A. Herr, St. Mary's Hospital

June 29, 1932 Uterotubogram, both tubes patent, spill in peritoneal cavity

May 6, 1933 Follow-up Personal call by operator at patient's address. Advised by Mrs G., with whom patient had formerly lived. The patient had moved to Canada six months ago. One letter had been received from patient shortly after arrival in Canada and there was no report of pregnancy at that time

May 8, 1933 **Conclusions** "Sterility operation," followed by patent tubes three months postoperative

This is the case referred to in my manuscript.

Signed EDWARD A. HERR.

PERSONAL HISTORY

CASE No 3

Name Mrs M C
Case No 1677 Date 5-8 33 Dr Edward A. Herr

Final diagnosis To be recorded when determined—Sterility Occlusion both tubes

Age 25 Sex F Race W M yrs 5 Adm
3 28 Dis 4-16-32 Occupation Housewife

March 28, 1923 History, married five years and never pregnant.

March 29, 1932 Uterotubogram showed both tubes occluded Diagnosis Sterility

March 30 1932 Sterility operation" Right tube Left salpingectomy performed due to pathology Dr Edward A. Herr, St. Mary's Hospital

May 1, 1932 Patient refused to cooperate by not consenting to report to the hospital for uterotubogram

May 6, 1932 Personal call by operator at address of patient. Patient has lived at this address for several months. Present address unknown. Land lord knows nothing of the whereabouts of the patient.

May 8, 1932 **Conclusions** Sterility operation on right tube March 30, 1932 Follow up impossible on account of change of address of patient

Signed EDWARD A. HERR

DISCUSSION BY DR. E. A. BULLARD,
NEW YORK CITY

No method has yet been invented which can be depended upon to maintain the patency of an occluded tube which has been opened by surgery. Strands of catgut, silk or filiform bougies have been left in the tubal lumen for varying periods of time, but in a day or two after their removal a Rubin tubal insufflation will find the tube closed almost invariably. In a small series of tubal resections I attempted to maintain the patency I had established with indwelling filiform bougies by daily Rubin insufflations after removing the bougies but in no case did the tubes remain patent over three days.

The milder types of salpingitis in which the lu-

men can be re-opened by the air insufflation of a hand syringe would seem to be the more promising cases for Dr. Herr's technique.

Perhaps the tubal catheters should be left in three weeks to allow ample time for the subsidence of tubal congestion, for if that is still present the lumen will be likely to close when the irrigations are stopped. I would be inclined to sew in the catheters with 40 day chromic catgut fearing that 90 plain gut might absorb and release them in a week. Possibly two irrigations daily will be necessary to prevent closure.

This is an ingenious experimental procedure with a certain amount of obvious risk of infection but which might succeed in establishing tubal patency where other methods would fail.

APLASTIC ANEMIA FOLLOWING THE TREATMENT
OF LUPUS ERYTHEMATOSUS WITH GOLD SODIUM
THIOSULPHATE, WITH REVIEW OF THE LITERATURE OF
THE HEMATOLOGICAL REACTIONS
FOLLOWING GOLD THERAPY*

BY WILLIAM DAMESHEK, M.D.†

APLASTIC anemia represents pathologically a condition in which the bone-marrow becomes incapable of further cellular growth. Since the marrow is the site of the production of all of the red blood cells, all of the blood platelets and about 70 per cent of the white blood cells, not only does a striking anemia develop but there is a marked leukopenia and an almost complete absence of blood platelets. In certain instances, the disease is said to be "primary" or idiopathic, arising *de novo* without any apparent etiological factor. However, instances of "primary" aplastic anemia appear to be diminishing as more and more substances become implicated as the direct cause of the bone marrow aplasia. Thus, in recent years benzol, arsenic, arsphenamine, roentgen rays, and radioactive substances have been incriminated.

Various salts of gold have been used for some years in the treatment of pulmonary tuberculosis. More recently, these preparations particularly gold sodium thiosulphate, have been used in the treatment of lupus erythematosus, which may be of tuberculous origin. In France, various compounds of gold have recently been used in the treatment of arthritis. Some of the preparations of gold which have been in common use are krysolgan (4 amino-2 auro-thiophenol carbonic acid), sancrysine (sodium aurothiosulphate), chrysalbine (sodium and gold thiosulphate), thiochrysine (sodium and gold thiosulphate), allochrysine (sodium aurothio-propanol sulphate), aurothioglucose, chrysoidal, and gold sodium thiosulphate. Krysolgan is

used extensively in Germany, sancrysine in the Scandinavian countries, and gold sodium thiosulphate in the United States. The rest of the preparations find their principal use in France. Although such reactions as fever, dermatitis, stomatitis, albuminuria and purpura had been reported following the use of gold, it was not until 1932 that a series of articles published in the French literature, stressed its deleterious effects on the blood-forming organs.

In the case reported below, a woman presenting the typical lesions of lupus erythematosus was given nineteen intravenous injections of gold sodium thiosulphate (totalling 17 Gm.) within a period of about five months. At about the time of the last injection, symptoms referable to anemia first developed and shortly thereafter she presented the typical clinical and hematological features of aplastic anemia. She was given sixteen transfusions of blood within a period of nine months but at no time did she show any signs of regenerative activity on the part of the bone-marrow and finally she died.

Although there is no absolute evidence in this case that the intravenous injections of gold sodium thiosulphate bore anything but a temporal relationship to the aplastic anemia, it was felt by the physicians who saw the patient that the drug was of direct etiological significance. The case is therefore reported with the possibility in mind that other similar cases may be observed. The literature bearing on the subject is reviewed and critically analyzed.

REPORT OF CASE

Edna S., B. I. H. 5312, a twenty-five year old housewife entered the Beth Israel Hospital September 30, 1930 complaining of weakness of two months duration. Until the present illness, she had always been well. On February 26, 1931 she came to the Outpatient Department where the diagnosis of lupus

From the Medical Clinic and Department of Pathology Beth Israel Hospital Boston.

This case was reported in part in a previous paper. Some Types of "Primary" Anemia and Their Treatment. E. J. Med. 205 1093 (Dec. 3) 1931.

†Dameshek, William—Associate Physician Beth Israel Hospital. For record and address of author see "This Week's Issue," page 709.

erythematosus, discoid type, was made in the Skin Clinic. She had noticed the eruption on her face in December, 1929 and since then it had gradually spread. At the time of the first examination, the front of the nose and the adjacent portion of the right cheek were involved with red, scaling, sharply defined lesions in which were present a few small follicular plugs. She was at once given an intravenous injection of 0.050 Gm of gold sodium thio sulphate. This was followed by slight transitory stiffness about the left knee, and the next dose was accordingly reduced to 0.025 Gm. In succeeding weeks, the dosage was gradually increased to 0.100 Gm. The lesions began to clear almost immediately, becoming fainter and flatter. On April 2, 1930 after five injections, she complained of pain in the left arm and shoulder and on April 9, because the pain persisted, she was given a careful physical examination in the Medical Clinic. Nothing abnormal was found. Routine hemoglobin tests and blood smear examinations were within normal limits. Since dental x-rays demonstrated areas of absorption and diminished density below the roots of three teeth these were extracted without untoward effect. However, at about this time (early May, 1930) the skin of the hands and forearms presented an itchy rash, became rough and scaly, and finally desquamated. The patient felt rather weak and remained in bed for twelve days. Despite these symptoms, the weekly intravenous injections of gold were continued, the last dose being given on August 6, 1930. At this time, the lesions of lupus erythematosus had entirely disappeared and the patient was discharged from the Skin Clinic.

Within a week after discharge, however, the patient noticed increasing weakness and developed in rapid succession dyspnea, palpitation, severe headache and progressive pallor. She noticed that slight trauma caused large ecchymotic spots on her arms and legs. The menstrual flow became greatly increased. During the next two months there was progressive increase in these symptoms and she was finally admitted on September 30, 1930 to the Beth Israel Hospital for study by Dr. Albert A. Shapiro.

Examination on admission disclosed a well developed and nourished, but very pale, woman. Two small pinpoint petechial spots were noted on the mucous membrane of the hard palate, and fading ecchymotic areas were present over the extremities. There was no hepatic or splenic enlargement. A few slightly enlarged cervical lymph nodes were felt. The temperature was 100°F, the pulse 120 per minute.

Several urine and stool specimens were normal. Blood studies disclosed marked anemia: hemoglobin 45 per cent (Sahli), red blood cell count 1,970,000, leukocyte count 3,200, blood platelets 10,000 per cu mm. The red blood cells, despite the marked anemia, were practically normal in appearance, round and without achromia. Differential count of the white blood cells showed a marked relative lymphocytosis, neutrophils 16 per cent, lymphocytes 79 per cent, monocytes 5 per cent. There was no polychromatophilia and reticulocyte count was 0.3 per cent. Only a rare blood platelet was seen. Bleeding time was at first normal, four minutes clotting time (3 test tube method) fifteen minutes; the clot, however, did not retract after fifteen hours. The fragility test was normal, hemolysis beginning at 40 per cent of sodium chloride and becoming complete at 33 per cent. Icteric index was 6.

The marked reduction in (1) the red blood cells, (2) the polymorphonuclear neutrophils and (3) the blood platelets was indicative of either a destructive or an aplastic condition of the bone-marrow, since all three elements of the marrow were involved. The normal or slightly elevated color index the

normal size and shape of the red cells and the extreme reduction in blood platelets were consistent with a diagnosis of aplastic anemia.

On October 4, biopsy of the sternal bone-marrow was done. This showed almost complete aplasia, with replacement by fat cells (Fig 1). Only a

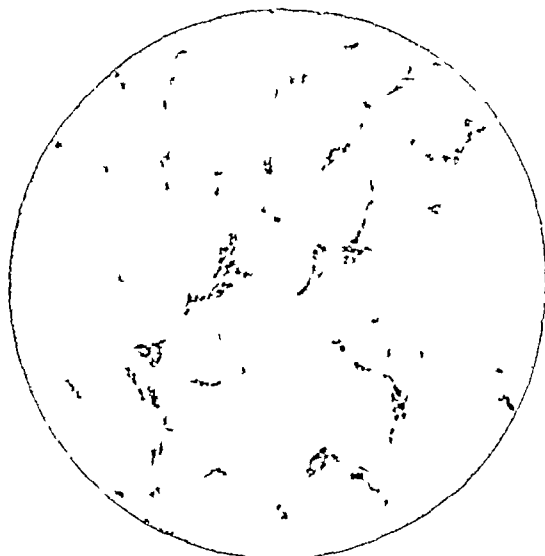


FIGURE 1. Photomicrograph of section of bone marrow removed at biopsy from sternum $\times 240$. Note that a few cellular islands still remain in the midst of large numbers of fat cells.

few small areas of blood formation were present, and in these a few normoblasts and an occasional cell of the myeloid series was demonstrable. Between the fat cells, the reticular cells (histiocytes) of the marrow were prominent. These generally contained moderate amounts of hemosiderin. No megakaryocytes were seen.

A section of the skin removed at the time of the sternal biopsy showed no evidence of deposition of gold particles. The anemia rapidly became more marked so that on October 5, 1930 she was given the first transfusion of blood. This resulted in only a temporary alleviation of the symptoms so that it soon became necessary to transfuse at approximately biweekly intervals. In all, sixteen transfusions were given. Each transfusion gave immediate relief and increased the red blood cell count by 600,000-700,000 per cu mm, and the blood platelet count about 50,000 per cu mm. However, within two weeks after this measure, the patient would again appear at the hospital, almost exsanguinated, bleeding from various sources and complaining of marked palpitation of the heart and severe headache. Red blood cell counts at these times showed figures ranging from 1,000,000 to 1,800,000 per cu mm. It was noted that the above symptoms usually reappeared when the red blood cell count fell below 1,900,000 per cu mm.

On October 18, she was given 10 cc of whole boiled milk intramuscularly, and shortly thereafter a series of four x-ray treatments in "stimulating" doses over the long bones. Six vials of liver extract (Lilly No. 343) were given daily from October 5 to November 23. These measures had no apparent effect on the blood picture.

In spite of the oft-repeated transfusions the patient gradually grew weaker, developed minor infections of the skin and severe subcutaneous hemorrhages. She entered the hospital for the last time on April 15, 1931 because of severe abdominal pain.

*Editor's note. This illustration has been slightly reduced.

and vomiting. Several subconjunctival hemorrhages and a peculiar grayish yellow pallor to the skin gave her an awesome appearance. Another transfusion of blood was given and was immediately followed by a marked reaction characterized by high fever, angioneurotic edema, asthma and hemoglobinuria. On the following day another transfusion was given. Three days later she developed cough and pain in the left chest. Examination disclosed a pleural friction rub in the left axilla and numerous crepitant rales in the left midchest posteriorly. She became comatose and died on April 21, 1931, permission for autopsy not being obtained. Death occurred approximately nine months after onset of anemia. During the last seven months of this period the patient's life was prolonged by a series of sixteen transfusions of blood.

DISCUSSION

Aplastic anemia was first described and named in 1888 by Ehrlich¹ who felt that the anemia was due to a failure of bone-marrow growth after hemorrhage. This view was subsequently modified by Engel² and Hirschfeld³ who recognized the purely degenerative (rather than "aregenerative") changes in the marrow. Frank⁴ called the disease "aleukia hemorrhagica" and claimed that it was a clearly defined disease entity, a "primary" disorder of the marrow ("panmyelophthisis") arising *suu generis*. This view has of necessity been modified since the publication of typical cases of aplastic anemia in which the etiological agent was readily discernible. Thus aplastic anemia caused by benzol was first described in 1897 by Santeson⁵, and in this country by Selling⁶. Later, arsphenamine became implicated (Gorke⁷) and since then many cases have been recognized⁸. The x-rays⁹, radium¹⁰ and radioactive materials¹¹ were found to cause the typical picture as were certain of the heavy metals such as mercury and silver¹². Thus, although the earlier cases of aplastic anemia were almost all reported as idiopathic, those of recent years have usually been stated to be due to some readily defined etiological agent.

In 1917 Carvadias and Monpharrato¹³ reported the use of intramuscular injections of colloidal gold in the treatment of chronic myelogenous and lymphatic leukemia*. The white blood cell count became moderately reduced in three of the five cases reported. No observations of the red blood cell or platelet counts are recorded. Reactions following the use of gold salts have been reported since this form of therapy was first introduced. Towle¹⁴ in reviewing 451 cases treated with gold found that some sort of reaction occurred in about one case of every six treated. Driver and Weller¹⁵ have classified the reactions as *immediate* (anaphylactic, mild fever and headache, metallic taste in the mouth, foreign-protein reaction), and *delayed toxic*. The latter, which occur usu-

ally after the second injection, may be manifested as fever, headache, nausea, vomiting, malaise, albuminuria, stomatitis, hepatitis, enteritis and dermatitis exfoliativa. There may be "toxic effects on the blood-vessels" with resultant stomatitis, hemoptysis, epistaxis, and menorrhagia. There is no mention in this review of cases which presented some type of "blood" reaction, i.e., anemia, thrombocytopenic purpura or agranulocytosis. However, in 1932, seven cases with severe hematopoietic reactions were reported in the French literature.

Emile-Weil and Bousser¹⁶ cite Kate Frankenthal as having reported (1919) the first cases of auric purpura. Stuhl¹⁷ in 1924 concluded that gold was a capillary poison and as such tended to cause bleeding. Ramondi and Sangiovanni¹⁸ (1926) and Bonafe and Mollard¹⁹ (1929) reported hemorrhagic eruptions following the use of gold salts. The first case, however, in which there was definite injury to the hematopoietic elements was reported by Emile-Weil²⁰ in 1931 (Table I). In this case, in which two doses of "chrysalbine" (0.3 Gm.) had been given, epistaxis, hematuria, and ecchymosis occurred. The red blood cells and leukocytes were unaffected but the blood platelets were reduced to 50,000 per cu mm. The patient recovered after a transfusion of blood was given.

Jacquelin and Allanic²¹ in 1932 reported as "agranulocytosis" a typical example of aplastic anemia following the use of chrysalbine. Achard, Coste, and Cahen²² reported two cases in the same year. The second case, although reported as "purpura hemorrhagica" also presented the typical features of aplastic anemia (marked anemia, leukopenia, and thrombocytopenia). Their first case, marked by a striking diminution in white blood cells, was classed as "agranulocytosis" and probably falls into that group, although the blood platelets were also somewhat diminished (140,000 per cu mm.). This case recovered following the use of adenine sulphate intravenously. Laignel-Levastine and Rey²³ reported a case of "purpura hemorrhagica" following the use of "allochrysine". Since the hemoglobin, erythrocyte, and leukocyte counts were all diminished, this case also appears to be a mild example of aplastic anemia (hypoplastic anemia) rather than of purpura hemorrhagica.

Angéras and Ginsbourg²⁴ reported a case of "aleukia hemorrhagica (agranulocytosis)" following the use of "chrysalbine". In this case as well, the diagnosis of aplastic anemia must be made since there was extreme reduction in red blood cells, leukocytes (500 per cu mm.) and probably in blood platelets (numerous hemorrhages). Emile-Weil and Bousser¹⁶, in their review of the "post-auric hemorrhagic states" report four cases in which hemorrhagic reac-

*I am indebted for this reference to the kind interest of Dr. George R. Minot who saw the above-mentioned patient in consultation.

erythematosus, discoid type was made in the Skin Clinic. She had noticed the eruption on her face in December, 1929 and since then it had gradually spread. At the time of the first examination, the front of the nose and the adjacent portion of the right cheek were involved with red, scaling, sharply defined lesions in which were present a few small follicular plugs. She was at once given an intravenous injection of 0.050 Gm of gold sodium thio sulphate. This was followed by slight transitory stiffness about the left knee, and the next dose was accordingly reduced to 0.025 Gm. In succeeding weeks, the dosage was gradually increased to 0.100 Gm. The lesions began to clear almost immediately, becoming fainter and flatter. On April 2, 1930 after five injections she complained of pain in the left arm and shoulder and on April 9, because the pain persisted, she was given a careful physical examination in the Medical Clinic. Nothing abnormal was found. Routine hemoglobin tests and blood smear examinations were within normal limits. Since dental x rays demonstrated areas of absorption and diminished density below the roots of three teeth, these were extracted without untoward effect. However at about this time (early May, 1930) the skin of the hands and forearms presented an itchy rash, became rough and scaly, and finally desquamated. The patient felt rather weak and remained in bed for twelve days. Despite these symptoms, the weekly intravenous injections of gold were continued the last dose being given on August 6, 1930. At this time, the lesions of lupus erythematosus had entirely disappeared and the patient was discharged from the Skin Clinic.

Within a week after discharge however the patient noticed increasing weakness and developed in rapid succession dyspnea, palpitation, severe head ache and progressive pallor. She noticed that slight trauma caused large ecchymotic spots on her arms and legs. The menstrual flow became greatly increased. During the next two months there was progressive increase in these symptoms and she was finally admitted on September 30, 1930 to the Beth Israel Hospital for study by Dr. Albert A. Shapira.

Examination on admission disclosed a well developed and nourished but very pale, woman. Two small pinpoint petechial spots were noted on the mucous membrane of the hard palate and fading ecchymotic areas were present over the extremities. There was no hepatic or splenic enlargement. A few slightly enlarged cervical lymph nodes were felt. The temperature was 100°F, the pulse 120 per minute.

Several urine and stool specimens were normal. Blood studies disclosed marked anemia: hemoglobin 45 per cent (Sahl), red blood cell count 1,970,000, leukocyte count 3200, blood platelets 10,000 per cu mm. The red blood cells, despite the marked anemia, were practically normal in appearance, round and without achromia. Differential count of the white blood cells showed a marked relative lymphocytosis: neutrophils 16 per cent, lymphocytes 79 per cent, monocytes 5 per cent. There was no polychromatophilia and reticulocyte count was 0.3 per cent. Only a rare blood platelet was seen. Bleeding time was at first normal, four minutes; clotting time (3 test tube method) fifteen minutes; the clot, however, did not retract after fifteen hours. The fragility test was normal, hemolysis beginning at 40 per cent of sodium chloride and becoming complete at 38 per cent. Icteric index was 6.

The marked reduction in (1) the red blood cells, (2) the polymorphonuclear neutrophils and (3) the blood platelets was indicative of either a destructive or an aplastic condition of the bone-marrow since all three elements of the marrow were involved. The normal or slightly elevated color index, the

normal size and shape of the red cells and the extreme reduction in blood platelets were consistent with a diagnosis of aplastic anemia.

On October 4, biopsy of the sternal bone-marrow was done. This showed almost complete aplasia, with replacement by fat cells (Fig. 1.) Only a

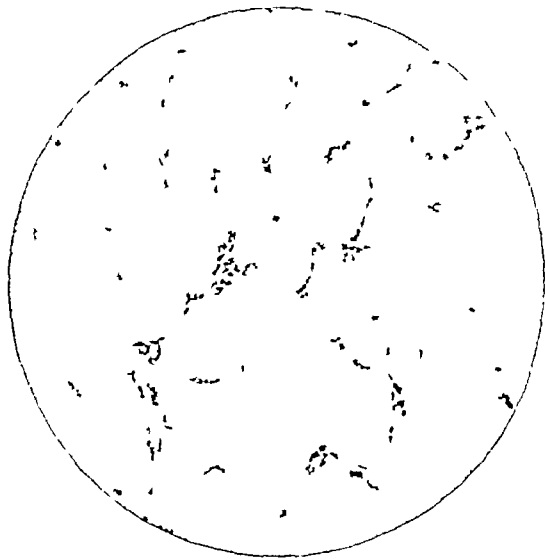


FIGURE 1. Photomicrograph of section of bone marrow removed at biopsy from sternum $\times 240$. Note that a few cellular islands still remain in the midst of large numbers of fat cells.

few small areas of blood formation were present, and in these a few normoblasts and an occasional cell of the myeloid series was demonstrable. Between the fat cells, the reticular cells (histiocytes) of the marrow were prominent. These generally contained moderate amounts of hemosiderin. No megakaryocytes were seen.

A section of the skin removed at the time of the sternal biopsy showed no evidence of deposition of gold particles. The anemia rapidly became more marked so that on October 5, 1930 she was given the first transfusion of blood. This resulted in only a temporary alleviation of the symptoms so that it soon became necessary to transfuse at approximately biweekly intervals. In all, sixteen transfusions were given. Each transfusion gave immediate relief and increased the red blood cell count by 600,000 to 700,000 per cu mm, and the blood platelet count about 50,000 per cu mm. However, within two weeks after this measure the patient would again appear at the hospital, almost exsanguinated, bleeding from various sources, and complaining of marked palpitation of the heart and severe headache. Red blood cell counts at these times showed figures ranging from 1,000,000 to 1,800,000 per cu mm. It was noted that the above symptoms usually reappeared when the red blood cell count fell below 1,900,000 per cu mm.

On October 18 she was given 10 cc of whole boiled milk intramuscularly and shortly thereafter a series of four x ray treatments in "stimulating" doses over the long bones. Six vials of liver extract (Lilly No. 343) were given daily from October 5 to November 23. These measures had no apparent effect on the blood picture.

In spite of the oft repeated transfusions the patient gradually grew weaker, developed minor infections of the skin and severe subcutaneous hemorrhages. She entered the hospital for the last time on April 15, 1931 because of severe abdominal pain.

*Editor's note. This illustration has been slightly reduced.

tions occurred. Two of these cases are palpably not "blood" cases being concerned with repeated hemoptyses following the use of gold preparations for pulmonary tuberculosis. In Case 3, there was leukopenia, anemia, and purpuric spots so that again the diagnosis of aplastic anemia appears justified. Case 4 of this paper is the same as that previously reported by Emile-Weil²⁰ noted above.

In addition to these cases Chevallier in discussing the case of Jacquelin and Allanic²¹ stated that he had seen several similar though milder cases following gold therapy. Emile-Weil¹⁶ at the same meeting stated that he had recently observed two similar cases and that gold could produce a series of myelotoxic states such as purpura agranulocytosis and aplastic anemia. Coste, Forestier and Bourderon²² listed among the accidents which might follow the use of intravenous gold therapy the following: cutaneous general ("grippe"), nervous, "focal", and finally hematological. Lacapere²³ warned that the necessity of utilizing large doses of gold in chronic arthritis might lead to accidents. He felt that it was necessary to study the blood-picture at least bi-weekly and recommended stopping the injections if the eosinophile percentage reached 6 or over. He noted the appearance of petechial spots in three cases when the eosinophile count reached 7-10 per cent. In another case he noted marked diminution in lymphocytes. Griveaud² reported the appearance of painful joints and purpuric spots which later became bullous after two injections of a gold preparation for the treatment of lupus erythematosus.

Driver and Weller's¹⁴ case which was diagnosed clinically as acute yellow atrophy of the liver showed the following blood-picture: hemoglobin 60 per cent, red blood cell count 2.70 millions, white blood cell count 5,600. No statement is made as to the count of the blood platelets or their estimation from the blood-smear. These authors state that Ormsby reported a case of aplastic anemia in 1928 in the discussion of a paper by Zeisler²⁵ on the reactions following the use of gold salts. However, Ormsby in the discussion of Driver and Weller's paper¹⁵ stated that although his patient presented hematuria and subcutaneous hemorrhages, the postmortem examination revealed marked cellular hyperplasia of the bone-marrow.

It is probable that other cases in which there was injury to hematopoietic tissue following the intravenous use of gold preparations have been observed. It is true that in none of the reported cases was there any direct proof that the gold salt was the cause of the hematological symptoms which followed its use. However the increasing number of cases which are being reported, their temporal relationship to the treat-

ments, the appearance of associated symptoms of heavy metal poisoning (gastro-intestinal symptoms, dermatitis) the fact that they came on following the use of various types of gold salts testify to the probable etiological relationship of the injections of gold salts to the various types of blood dyscrasia. At any rate due attention should be paid to painful joints, petechial spots and erythematous lesions of the skin particularly if desquamation occurs. In the case reported in this paper although painful joints were noted and although the patient developed erythematous later desquamating lesions of the hands the treatment with gold was continued. The first symptoms referable to anemia coincided with the last of nineteen weekly injections of gold sodium thiosulphate.

Several observers have noted the striking similarities between the reactions following the use of arsenic (arsphenamine) and of gold.^{13, 18} Aside from its effect on the skin, liver, gastro-intestinal tract etc. the various preparations of arsphenamine have been shown to produce striking disturbances of the bone-marrow.²⁹ Thus when the entire marrow is involved aplastic anemia results with severe anemia, leukopenia and thrombocytopenia. However the effect on the marrow may be selective so that only the leukopoietic elements are involved (agranulocytosis) or the megakaryocytes affected (thrombocytopenic purpura). The same types of bone-marrow reactions have been noted following gold therapy. Thus the case of Jacquelin and Allanic²¹, the second case of Achard, Coste and Cahen²², the cases of Laignel-Lavastine and Revt²³ and of Angéras and Ginsbourg²⁴, and the third case of Emile-Weil and Bousser¹⁶ are typical examples of aplastic anemia of varying severity. Emile-Weil's case reported in 1931²⁰, may be classified as thrombocytopenic purpura since it showed extreme reduction in the blood platelets although the red cells and white cells were unaffected. The first case of Achard, Coste, and Cahen²² may be classed as "agranulocytosis" since the white blood cells were conspicuously affected (W. B. C. 1200 polymorphonuclear cells 5 per cent) while the red blood cell count was normal. This case reacted well to adenine sulphate given intravenously.

SUMMARY

A case of aplastic anemia which followed the administration of gold sodium thiosulphate for the treatment of lupus erythematosus is reported. The patient died although sixteen transfusions of blood were given.

The literature of the hematological reactions following the use of the various gold compounds is reviewed. Although there has been as yet no absolutely conclusive evidence that gold has a direct toxic effect on the bone-marrow the occurrence of similar cases with various types of

TABLE I

Author	Year Reported	Type of Case	Preparation	Total Dosage	Hematologic Manifestation	End Result	Hgb B C	R B C	W B C	Blood Picture Platelets P	L	M	E
Emile Well	1931	Pulmonary T B	Allochrysine Chrysolal	About 70 injections	Purpura hemorrhagica	Recovery	4 92	14 400	50,000	73	—	—	—
Jacquelin and Allanic	1932	Pulmonary T B	Chrysalbine	3 0 Gm	"Agranulocytosis" (aplastic anemia)	Death	30	1 80	1,650	7 58	35	—	—
Achard, Coste, Cahen	1932	Infectious arthritis	Aurothio- glucose	About 1 0 Gm	Agranulocytosis	Recovery— treated with nucleotide	4 60	1 200	140,000	5	—	—	13
Achard, Coste, Cahen	1932	Polyarthritis	Chrysalbine	About 1 0 Gm	"Purpura hemorrhagica" (aplastic anemia)	Death	2 38	2 200					
Laignel Levastine and Reyt	1932	Pulmonary T B	Allochrysine	About 1 0 Gm	"Purpura hemorrhagica" (hypoplastic anemia)	Recovery (transfusion liver extract)	45	2 02	4,000	300,000			
Angéras and Ginsbourg	1932	Pulmonary T B	Chrysalbine	10 Gm	Aplastic anemia ("leucie hemorragique- agranulocytosis")	Death	40	2 10	500	1 70	16	—	—
Emile-Well and Bousser	1932	Hypertrophic arthritis	Allochrysine	1 20 Gm	Aplastic anemia ("hemorrhagic accident")	Death	1 61	3 200					
Author's Case	1931 1933	Lupus erythema- tosis	Gold sodium thiosulphate	1 7 Gm	Aplastic anemia	Death	45	1 97	3 200	10,000	16 79	5	5

— Denotes absence of recorded figure in article

material for study has grown scanty in recent years as the distribution charted in table 1 shows

TABLE 1

SPECIMENS OBTAINED IN RECENT YEARS

Specimen	1923	1924	1925	1926	1927	1928
Obtained by resection	0	1	0	0	2	1
Obtained at necropsy	12	12	4	4	5	2

In this investigation the specimens in which the earliest stages of the disease were represented were obtained from those unfortunate patients in whom, following some unrelated operative procedure there developed a rapid fulminating type of acute ulcerative colitis with bloody diarrhea wasting and dehydration, and who, despite all measures succumbed in a short time. Such tragic occurrences are fortunately rare, but the material obtained at necropsy offered a splendid opportunity for study of the lesions in the early stages of the disease.

Buie and Barga recently have accurately de-

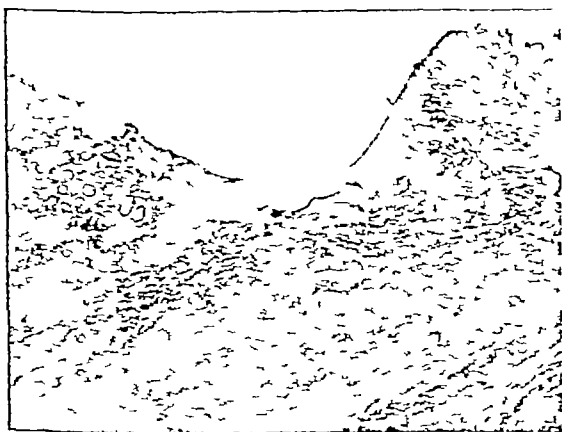


FIG. 1. A shallow ulcerated region. The mucosa on the side appears as a tufted projection which might easily be called polypoid.

scribed the pathologic changes which occur in a colon during the development of chronic ulcerative colitis. Our purpose here is to describe the sequence of formation of polyps and to suggest the probable relationships that exist between massive colitis and the neoplastic disease which occasionally occurs in these cases. To that end we have selected specimens illustrating various phases of this disease and its sequelae. Innumerable similar specimens have been observed in many cases.

Microscopic study of sections of the acutely diseased colon revealed intense inflammation of the entire thickness of the intestinal wall with disseminated hemorrhages. A few early abscesses of rather superficial type were noted, and in many instances these cup-like areas of mucosal denudation had, at their periphery, ridges and tufts of fairly intact mucous membrane. It is

to these tufted pseudo-projections that we wish to direct attention. These abscesses, bounded as they are by more or less intact mucosa, tend by their very act of ulcerating, to produce tufts on the sides which on superficial examination appear as the usual adenomatous polyps but which on more careful study rarely give evidence of true adenomatous hyperplasia (fig. 1).

It is our belief that at first this piling up of tissue is not the result of a true response by hyperplasia of adenomatous tissue. In practically all instances during the stages of abscess and ulcer, we noted tag-like tufts of highly inflamed mucosa between which were ulcers.

The secondary changes in chronic ulcerative colitis may be divided into two phases. First, there is the truly healed colon presenting the picture described by Buie, of pock-like scars, with thickening and contraction of the wall. Secondly there is the variety of change, represented by remissions and the local complications, such as strictures, polypoid tags, true adenomatous polyps and carcinoma. No two pictures are ever the same. All types of distortion and secondary infection may be noted and, as has been mentioned, adenomas and more rarely carcinomas may gravely complicate the picture.

The reason for distortion of the mucosa in a case of chronic ulcerative colitis of long standing is easily appreciated after detailed study of sections from the colon obtained at necropsy. Nodular tags, shreds of thickened tissue, bridges of undermined mucosa, and long, polypoid tufts (fig. 2) are common. Some polyps are large and have a stalk but give no evidence of adenomatous hyperplasia (fig. 3). Others are small and more sessile (fig. 4).

Bridging of the mucosa was frequently observed. This merely represents failure of complete separation of a mucosal tag at both ends.

True adenoma is observed as a sequel to these changes in some cases of chronic ulcerative colitis. It is a later complication and tends to manifest itself as the afflicted colon slowly rids itself of the original disease. Then the tufts of mucous membrane in what is apparently a regenerative effort, begin to give evidence of true and easily demonstrable hyperplasia. They may project into the lumen, dragging the submucosa with them ultimately developing stalks. They are always sites of inflammatory reaction, and in many instances especially at their tips, give evidence of a fairly rapid and poorly controlled effort at growth. Since they appear in an already badly diseased and distorted colon, a different picture is seen from that of the so-called congenital type of polyposis. Here, then, the hypothesis that formation of polyps is the result of irritation appears well grounded (fig. 5).

With secondary infection or remission, a not infrequent occurrence, it is not difficult to prophesy the disturbances that may occur when there is such glandular proliferation, and as the

gold salts is indicative of an etiological relationship

The hematological reactions which occasionally follow the administration of arsphenamine and gold are similar in nature. Thus aplastic anemia (complete bone-marrow involvement), thrombocytopenic purpura and agranulocytosis (selective bone-marrow involvement) may occur with both forms of therapy. Due attention should therefore be paid to possible alterations in the blood cells during the administration of both arsphenamine and gold.

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THE NEOPLASTIC FACTOR IN CHRONIC
ULCERATIVE COLITIS*

BY JOHN C M BRUST, MD,† AND J ARNOLD BARGEN, MD†

A SPECIMEN illustrating the pathologic lesions of chronic ulcerative colitis was exhibited by Sir William Allestin in 1885 before the London Pathological Society. This is the first record of this disease being recognized as a pathologic entity. The lesions were rather accurately described by Hale White in 1888. An excellent, although brief, discussion of the ulcerative stage of the disease was presented by Smith in 1925 and a more detailed study by Lynch and Felson in the same year.

Many years ago, Virchow called attention to the lesions that he designated as "colitis polyposis cystica," but it was not until recently that a connection between this cystic, polypoid condition of the colon, and the disease now known as chronic ulcerative colitis, was demonstrated. In 1930 Bargaen and Comfort called attention to the frequency with which a polypoid condition follows ulcerative colitis, and in a review of 693 cases they noted the ultimate presence of polyps in ten per cent. They also il-

lustrated how neoplasms occurred in chronic ulcerative colitis and advanced as a possible hypothesis a sequence of events following through the phases of ulcerative colitis, the development of adenomatous polyps, and in some instances the malignant change of these polyps. This hypothetical sequence of events stimulated us to a more intensive investigation of the gross and microscopic changes in the colons of patients with this form of colitis.

The specimens were obtained from the Sections on Surgical Pathology and Pathologic Anatomy of The Mayo Clinic and consisted of the following: (1) colons obtained by resection and at necropsy, collected during ten years, representing forty-three patients who had suffered from chronic ulcerative colitis in its various phases, (2) a small number of specimens removed for study at the time of proctoscopy. These latter specimens included polypoid excrescences noted in cases in which the disease was advanced or recurrent, or in which healing had taken place.

Tremendous strides have been made toward the successful care of patients with chronic ulcerative colitis, and a progressive decrease in surgical intervention has taken place. Hence,

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involving multiple regions of the already diseased colon, and presenting usually a high grade of malignant growth, it presents an essentially hopeless outlook.

It frequently has been observed that adenomas of the colon undergoing malignant change tend to produce carcinomas, and these may be of the lower grades of malignancy. Most of the specimens of carcinoma following chronic ulcerative colitis seen at the clinic, however, have exhibited a most virulent and high degree of malignancy. In some cases a transition from ulcerative colitis, through adenomatous change into malignancy, has apparently occurred. In most cases, too, there has been the tendency of this

roentgenogram gave evidence of involvement of the entire colon with marked narrowing. The value for hemoglobin was 45 per cent. Treatment with vaccine prepared from the diplostreptococcus of chronic ulcerative colitis and local treatment for the rectal stricture, were undertaken. There was some improvement. The man returned home and for several months there was continued change for the better such as reduction in rectal discharges and general improvement.

He returned February 4, 1926, with the history that three weeks before there had been an exacerbation of the diarrhea with much pain and that the perianal fistula had reappeared. On February 12, ileostomy was performed. Failure was progressive. Death occurred February 25, and at necropsy the following conditions were found: chronic ulcerative colitis involving the entire colon and the ter-

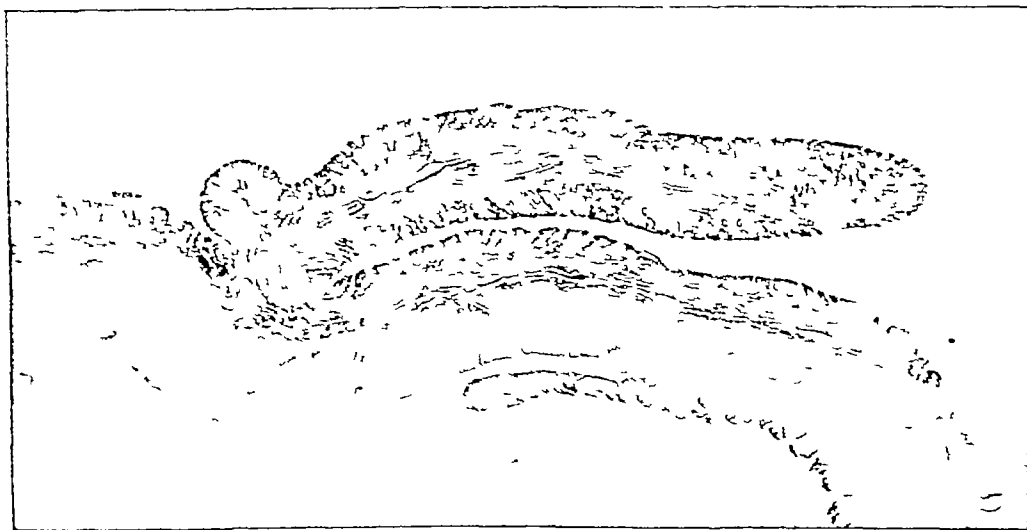


FIG. 5. A long finger like projection with evidence of true adenomatous hyperplasia at its tip.

type of malignant change to involve long reaches of the afflicted bowel and to progress in a most fulminating manner. We are forced, then, to assume that there is a tendency in chronic ulcerative colitis toward growth of neoplasms which in some cases produces small adenomas and in some instances pursues a ruthless course on to malignancy. Whatever this factor is, we assume that either its potency is a variable one or else that the individual resistances, be they general or local, are widely different in their activity.

The following report illustrates the complication of carcinoma. In this case only a few small adenomas were found at necropsy, whereas a most extensive carcinomatous change of the colon existed.

CASE 1. A man aged twenty-six years registered at the clinic October 2, 1925. For years he had had six or eight watery or liquid stools daily and blood had been mixed with them or passage of blood had followed them occasionally. He was underweight and asthenic. There was an anorectal stricture with a sinus to the right of the anus. The typical picture of advanced chronic, ulcerative colitis with a polypoid mucosa was seen proctoscopically. The

minimal part of the ileum, diffuse carcinoma of the entire colon, and extensive pericolic carcinomatous lymphadenitis.

COMMENT

In a previous report it was observed that in 2.5 per cent of 800 cases of chronic ulcerative colitis carcinoma of the colon developed during the period of observation. To evaluate the significance of this figure we have consulted the mortality statistics published by the United States Department of Commerce for 1923 to 1929, inclusive. We found according to these figures that approximately 0.011 per cent of all persons in the United States registration area die of carcinoma involving the intestine, including the rectum. Since the percentage of persons who have carcinoma following chronic ulcerative colitis is considerably greater than the percentage of persons in the general population who die of carcinoma of the intestine, including the rectum, the conclusion seems warranted that there is a definite carcinogenic factor in chronic ulcerative colitis.

During the years that the 800 cases of chronic

débris chokes the glands, the ultimate "colitis polyposis cystica" becomes a logical sequence

Specimens were obtained for biopsy also from

We would again emphasize that true adenomas are rare following chronic ulcerative colitis, as compared with the myriads of small tufts,



FIG 2 A long polypoid mucosal tag projecting into the lumen. It is highly inflamed and its mucosal covering is badly injured

some of these mucosal tags in cases in which chronic ulcerative colitis had undergone healing and the patients had returned for clinical observation, occasionally years after all active

tags, and finger-like projections that have here tofore engaged attention. How often they may occur in cases in which healing has taken place, no one can say

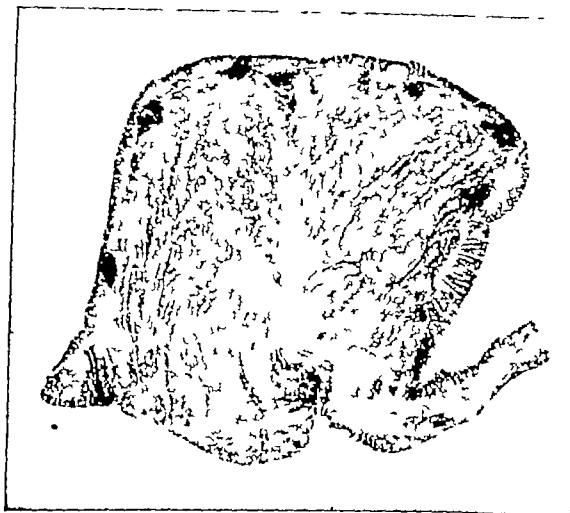


FIG 3 A very large bulky polyp on a stalk. The mucosa is present in patches and the main substance is composed of connective tissue. In this large tag there is no evidence of adenomatous hyperplasia.

symptoms of disease had subsided. These tags had the gross appearance of adenomatous polyps, and microscopically some of them were incontrovertibly true adenomas

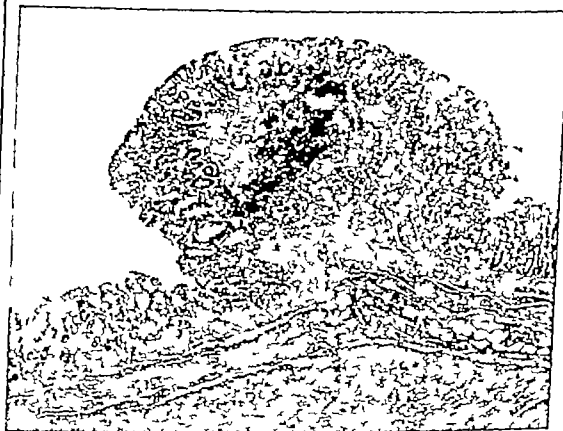


FIG 4 A small polyp more sessile than that illustrated in figure 3. The mucosa shows evidence of disease. The glandular hyperplasia of a portion of this tag however indicates activity and an effort toward regeneration is becoming apparent. The appearance of the submucosa would easily lend support to the thought that the polyp is undergoing a "pull or tug"

Carcinomatous change in the colon, following or during the course of chronic ulcerative colitis, although not frequent is nevertheless a tragedy encountered in a small number of cases. Occurring, as it does, in younger patients, in-

as it enlarges, a brief review of the anatomy of this region is presented

The ischiorectal fossae are cavities filled with fat and situated on either side of the rectum. Anteriorly they are separated from each other by the rectum and the prostate (or vagina). Posteriorly they are in contact save at the anococcygeal raphe. Seen in frontal view the fossa has the shape of a triangle with its apex superior. Its lateral wall is relatively rigid and is formed by the ischial ramus covered by the obturator internus muscle and aponeurosis. Lying in a reduplication of this aponeurosis are the internal pubic vessels and the nerve of the same name.

The medial wall relatively mobile, is formed by two muscles which are from above downward, the levator ani and the internal rectal sphincter. The levator ani separates the ischio-rectal fossa from the subperitoneal space. The internal sphincter of the rectum represents the inferior portion of the medial wall of the fossa. It is formed of concentric fibers which surround the terminal portion of the rectum.

The base of the above mentioned triangle is represented by the skin and subcutaneous tissue. The apex is formed by the junction of the levator fascia and that of the obturator internus.

The fossa measures five centimeters anteroposteriorly, two and one-half centimeters laterally and from five to seven centimeters vertically. From each ischiorectal fossa extend two prolongations, an anterior and a posterior. The anterior sweeps around the prostate and extends up to the level where the levator joins the fascia of the obturator internus, terminating at a point near the upper margin of the pubis. The posterior prolongation lies between the deep aspect of the gluteus maximus and the levator ani. It extends up to the region of the spine of the ischium at the level of which it tapers out to an end.

The ischiorectal fossa is lined with fascia covering the superficial surfaces of the obturator internus and the levator ani muscles. This fascia is continuous with the fascia covering the gluteal muscles laterally, Colles' fascia or the superficial fascia of the superficial perineal space, and the fascia covering the deep surface of the urogenital triangle, deep to which is found the pubic extension of the ischio-rectal fossa. On the medial surface of the ischio-rectal fossa the fascia may extend as far superficial as the outer margin of the external sphincter ani. The inferior hemorrhoidal vessels and nerves pass through the ischio-rectal fossa accompanied by an exceedingly thin fascial sheath which extends from the point where they pierce the obturator fascia covering Alcock's canal to the points where they pierce the fascial covering of the medial surface of the ischio-rectal fossa. Between the ischio-rectal fossae posteriorly is a fat filled space by means of which the

fossae can communicate by rupturing an almost insignificantly thin fascial layer.

PATHOLOGIC ANATOMY

We would expect to find sarcomata arising either from bone, muscle or fascia. Edwards² case, cited below is in fact one in which the tumor arises from the fascia of the medial aspect of the ascending ramus of the ischium. The sarcoma described by Shoemaker³ originated from the medial aspect of the ischial tuberosity.

The ischio-rectal fossa, however, can be the seat of sarcomata arising other than from the bony pelvis. In my case the growth apparently arose from the muscularis of the rectum.

SYMPTOMATOLOGY AND PHYSICAL SIGNS

If the tumor is large, a definite asymmetry of the perineal region will be noted with the patient in lithotomy position. In some cases there is a projection elevating the overlying tissue and deviating the usual position of the scrotum, labium or the crease between the buttocks. The anus may be hidden by the superimposed mass. Tumors of the ischio-rectal fossa usually vary in size from about three to about ten centimeters in diameter but have even been described as being as large as the head of a fetus at term. The overlying tissue is usually normal in appearance and is usually not adherent to the tumor but may occasionally, if secondarily inflamed, be a violet-red and suggest an underlying abscess.

The consistency of ischio-rectal neoplasms of course varies with the type of tumor. The sarcomata almost invariably are definitely indurated.

Rectal and vaginal examinations aid in fairly accurately estimating the size of the tumor, the area it occupies, and sometimes its origin. We can by this means often determine whether it is adherent to neighboring structures and whether it sends forth any prolongations. These latter may project indefinitely into the buttock, vagina, or vulva, or they may become intrapelvic and extend upward to a point beyond which the finger in the rectum may not reach. They may arise from the posterior surface of the rectum and flatten out against the sacrum or from the anterior surface and be deformed by the pubis. If they arise from the lateral aspect of the rectum, as in my case, the intestine is distorted toward the opposite side. Occasionally the tumor presses so firmly against the anus that there is considerable difficulty in entering the canal. In none of the tumors described above was the mucous membrane of the rectum or anus involved.

Occasionally these growths cause a functional disturbance, due almost always to the compression of some structure and varying with the

ulcerative colitis were observed, the incidence of carcinoma of the large intestine among patients registering at the clinic was 0.88 per cent

The study of the pathology in these cases disclosed some enlightening facts. We feel rather strongly that the true adenomas following chronic ulcerative colitis are subject to the same likelihood of malignant change as is any type of colonic adenoma. We also feel that the formation of adenomas consequent to ulcerative colitis is a result of the same initiating force that eventuates in some instances in carcinoma. But it is impossible to determine how a given case of chronic ulcerative colitis will act. The colon may heal, and results over a decade show that specific treatment tends to produce this happy result in a large proportion of cases. The colon may, as a result of intense destruction, exhibit scars, strictures, mucosal ridges, or tags of mucosa. The mucosal tufts may, at any time, begin to give evidence of true adenomatous hyperplasia and may eventuate in multiple adenomas studding the colon. And lastly, but fortunately rarely, carcinoma may supervene as an early or late complication.

Numerous observations of many patients with chronic ulcerative colitis have demonstrated the formation of polyps following colitis.

Treatment of these later and intractable sequelae is a problem by itself. It would appear evident that any type of treatment that tends to check the destructive infection of the colon

is to be greatly desired. Surgical intervention is notoriously fraught with danger to these patients and its indications will be considered in a future communication.

SUMMARY AND CONCLUSIONS

A study of pathologic changes in the colons of forty-three patients with chronic ulcerative colitis indicates that the development of true adenoma following chronic ulcerative colitis, although not common, is noted with sufficient frequency to warrant attention. Carcinomatous change of the colon already involved by chronic ulcerative colitis is noted with great frequency as compared with its occurrence in persons with no known preexistent infection. Microscopic and gross study suggests a transition from ulcerative colitis through adenoma to carcinoma in some cases.

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NEOPLASMS ORIGINATING IN THE ISCHIORECTAL FOSSA WITH PARTICULAR REFERENCE TO SARCOMATA

BY W. M. SHEDDEN, M.D.*

TUMORS of the ischiorectal fossa are uncommon. Chavelet⁴ was able to collect only eleven reports of neoplasms in this location. Comprising this group were three myxomata, three fibromyomata, one lipoma, one fibroma and one fibrolipoma. There were only two proved sarcomata. Sarcomata, of course, may be found anywhere in the body where there is a derivative of the embryonic mesoderm. They are from time to time reported in the pelvis, behind the pelvic peritoneum, involving ovary, uterus, pelvic intestine, sacrum or one of the pelvic bones, but it is extremely rare to find a sarcoma originating in the ischiorectal fossa. In a series of fifty-four cases of osteosarcoma of the bones of the pelvis collected by Havage¹, there were none springing from the ischium or pubis and none situated in the ischiorectal region.

Reports of the two cases of sarcoma originating in the ischiorectal fossa I have reproduced below in some detail and have added a case from my private files. A search of the three series of the Surgeon General, 1886, 1903 and 1926, the *Index Medicus* from 1903 through 1927 and the *Quarterly Cumulative Index* from 1916 through March of 1933 reveals no more reports of instances of this disease.

Tumors of the ischiorectal fossa are seen more commonly in males than females. In eight of the eleven cases reported by Chavelet the individuals affected were males and two of the three sarcomata described below were seen in individuals of the male sex.

It is of interest to note that two of the sarcomata here reported were seen in persons in the second decade of life. My case was aged 60.

ANATOMY

As an aid in studying these reports and in understanding the path followed by the tumor

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the sphincter ani was preserved and only the superficial portions of the left labium majus. The constrictor vaginae on the left side was sacrificed and the erector clitoridis cut in two. The trunk of the internal pudic artery was caught behind the tuber ischii. The tumor when removed, was three inches in anteroposterior diameter and one-half inches in lateral diameter. Postoperatively, marked edema of the anterior portion of the genitalia developed making catheterization very difficult. There was no lack of control of the sphincter ani. Microscopical examination showed a sarcoma of mixed type.

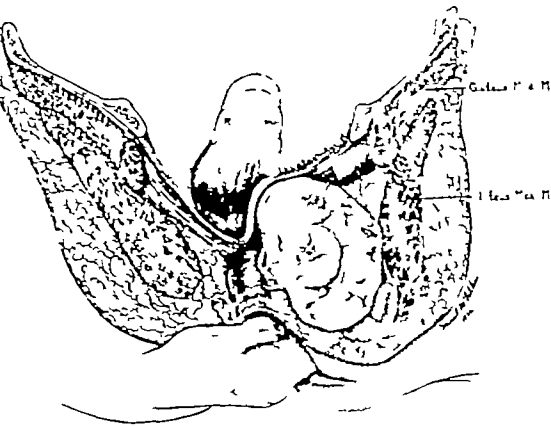
Recurrence was rapid locally and generally. The vulva and perineum of the left side were first invaded the inguinal glands later. At the end of six months pressure was interfering with respiration and death was reported imminent.

3. Authors case

P. I.—A vigorous man of sixty had noticed a small lump posterolateral to the rectum for one year. It had gradually grown larger and harder and had been quite sore for the past three or four months. No constipation nor urinary symptoms. No sciatic pain.

P. H.—Peritonitis 37 years ago. Question of rheumatic fever four years ago. No cardio-respiratory, gastrointestinal or urinary symptoms.

P. E.—Well developed and nourished. Weight 215 pounds. No palpable glands. Lungs clear and resonant throughout. *Local examination* About three centimeters to the left of the anus and apparently lying



in the ischioanal fossa is a protuberance. Palpation of this with one finger in the rectum shows it to be free from adhesion to surrounding structures save where it is in contact with the rectum. Here it is firmly adherent over an area the diameter of which is about two centimeters. This area is about three centimeters above the anus. The perineal skin over the tumor showed a fresh incision about four centimeters long through the subcutaneous tissue. (This exploratory incision had been made the previous day by another doctor.)

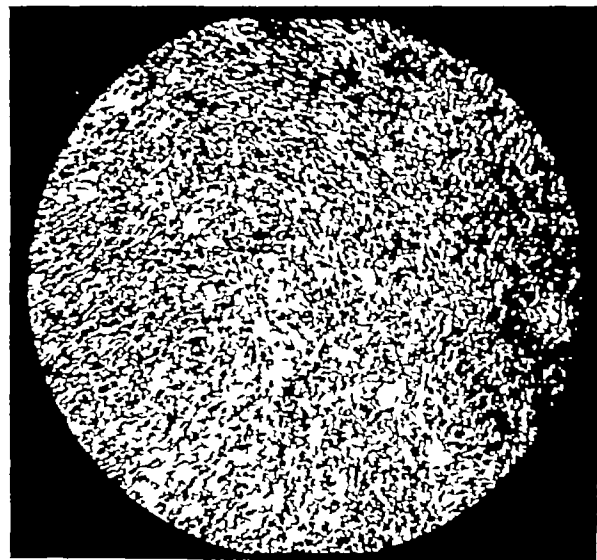
X-ray of chest—there is thickening of the pleura and a mottled dullness in both apices. The mottled area appears partially calcified on the left. The lung fields and mediastinum are otherwise normal in appearance. There is no evidence of metastatic malignancy. Urine including sediment, negative.

Operation (spinal anesthesia). Incision over prominence in left perineum running radially from anus extending the one above described. A hard rounded tumor was disclosed lying just beneath the subcutaneous tissue and not adherent to it. Laterally it lay under the medial edge of the gluteus maximus. Several

branches of the internal pudendal artery and vein were clamped cut and tied. The tumor shelled out easily save at its medial aspect. Here it was solidly adherent to the rectum in the region of the internal sphincter. This area was excised widely with diathermy (coagulating current) going through both sphincters. Cut ends of sphincters then loosely drawn together with mattress sutures of heavy silk. Wound loosely, pulled together superficially and drained.

Pathological Report The specimen consists of a well-circumscribed tumor 9 cm. in greatest diameter. On section it has a granular yellowish white firm surface. Most of its outer surface is smooth but there is a small area about 2 cm. in diameter which is roughened.

Microscopic sections show the structure of sarcoma. The arrangement and appearance of the cells suggest a tumor of smooth muscle. No myofibrils can be demonstrated. There are numerous mitotic



figures. The histologic appearances are those of a medium rate of growth.

Postoperatively the patient was constipated with deodorized tincture of opium. The coagulated stump of the sphincters sloughed somewhat but there remained some union of the muscle after the sutures cut through. Patient had slight incontinence for about four weeks. Since then there has been no incontinence.

Patient was given a prophylactic postoperative x-ray treatment consisting of 1200 r over a four day period employing 200 K V with a distance of 50 centimeters and screening of copper $\frac{1}{2}$ millimeter and celluloid 4 millimeters.

When seen recently fourteen months since operation, no recurrence is seen or felt. There is no incontinence. The operative area in the region of the sphincters is represented by a band of scar about 2 x 1.5 centimeters in diameter.

CONCLUSIONS

1. The ischioanal fossa may be invaded by tumors developing from its limiting walls from the tissue which fills it or as an extension from a neoplasm lying in the environs as sacrum, coccyx, pubis, etc.

2. These tumors may cause symptoms resulting from local increase of pressure.

shape, volume and situation of the tumor This disturbance is usually augmented if the patient stands up and even more so when he sits Deformity of the rectum, anus or bladder from external pressure may give rise to abnormalities of defecation or urination The patient may simply be constipated or he may have difficulty in consummating defecation The stools may be infrequent and ribbon-like or there may be an uncomfortable abdominal distention Micturition may be slow and painful

If the tumor projects into the labium major there may be difficulties with coitus because of pressure narrowing the vaginal canal

Usually the tumor is painless Rarely there is pain referred to along the course of the sciatic nerve

DIFFERENTIAL DIAGNOSIS

Abscess can usually be ruled out because of its speed of development and the usual elevation of temperature and white blood count, its early tenderness or fluctuation More difficult to differentiate would be an abscess arising from a lumbar Pott's disease or tuberculosis of the bony pelvis However, the course of the disease, and usually the x-ray picture would aid in differentiation

We must distinguish an ischiorectal tumor from one arising in the neighborhood, such as

a Tumor of the perineum. Rectal examination will show it to be outside the ischiorectal fossa Perineal cancer arising from the urethra or in urinary fistulae might occasionally be confused with an ischiorectal sarcoma

b Tumor of the labium major Palpation will show that it is growing centrifugally from the labium as a center

c Perineal hernia This very rare hernia protrudes between the rectum and bladder in the male and between the uterus and the rectum in the female Its consistence and the fact that it can be partially or completely reduced would undoubtedly make the diagnosis

d Gumma of the anus At first this tumor is very firm, but it soon breaks down and drains externally

e Anal carcinoma invading the ischiorectal fossa Its cauliflower appearance, however, is quite characteristic There is usually anal tenesmus and pain

f Teratomata. These are usually mobile under the skin but fixed to the coccyx Their consistence is variable

PROGNOSIS

If these tumors are thoroughly extirpated locally, the prognosis is good Two of the three sarcomata reported below are well after one to several years

TREATMENT

Operative extirpation, if possible, is always advisable If the tumor has a pedicle it is well to go widely around it with diathermy or cautery Postoperative radiation undoubtedly delays recurrence in the case of the round celled sarcomata It may be necessary to destroy part of the anal sphincter as was done in my case If so, an attempt at reconstruction may be made immediately or when the wound has started to granulate

CASE HISTORIES

1 Edwards reports the case history of a man of twenty years who had noted for about three months a tumor situated to the right of the anus Examination showed the mass to be nodular and projecting toward the rectum but not involving its mucosa. A finger in the rectum could reach above its upper limit Thinking that an inflammatory condition was present, the tumor was incised As no pus exuded, a specimen was removed for pathological examination This section was reported to be of an inflammatory nature but nevertheless, as it continued to grow, Edwards decided to remove the mass which was then the size of two fists It was extirpated in two sections including a portion of the rectum It apparently arose from the periosteum of the ischium The bulb of the urethra was exposed Microscopically, it was a round celled sarcoma We have, nine years later, a statement that "the patient is now in good health"

2 Shoemaker reports a case "In the early stages of which it was difficult to differentiate the tumor and low grade connective tissue inflammation Careful observation, however, demonstrated continuous growth and increasing fixation to surrounding tissue There was no tenderness, a discrete form, no tendency to involve the rectal wall or to point externally The case report follows

A well-developed, strong, and vigorous girl of twenty-one Family history negative Menstruation regular and normal No history of injury

One month before entry she noticed a lump the size of a walnut deep in the left perineum There was a perineal ache in the region of the tumor but no throbbing or tenderness No history of abnormal discharge or constipation

Examination revealed to the left of the rectum and vagina and behind a line drawn from the posterior vaginal commissure to the tuberosity of the ischium extending from the rectal wall out nearly to the ramus of the pubis and nearly to the tuberosity a mass three inches from front to back, two inches from right to left, against the rectal wall but not infiltrating it, somewhat movable No softening or redness

Operation An anteroposterior incision was made over the prominence one and one-quarter inches to the left of the median line immediately opposite the center of the perineum There was no true capsule and no sharply defined line between normal and new tissue Small areas of hardening projected from the growth anteriorly toward the vulva. At no point was the skin or mucous membrane involved The growth invaded all tissues up to the rectal and vaginal walls and between them and the tuberosity including muscle and fat Half an inch behind the edge of the ischium it appeared to be firmly attached The fingers were used to enucleate the mass and by blunt dissection it was separated from the pubis and ischium It did not appear to infiltrate or expose bone A superficial portion of

CASE RECORDS
of the
MASSACHUSETTS GENERAL
HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED
IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 20131

PRESENTATION OF CASE

An American college professor thirty years old entered the hospital complaining of rectal pain of two days' duration

Nine months before entry, following a bowel movement during the night, he had a continued desire to defecate, but without result. At this time he developed smarting, burning rectal pain which increased in severity and kept him awake all night. After this episode he was symptomless until three weeks before entry. At this time, the day following Thanksgiving, he began to have about five loose bowel movements a day, without blood, pus or mucus. This diarrhea continued for a week without any change. Two weeks before entry he changed his diet to one consisting for the most part of tea and toast. His diarrhea continued however, and the stools even became more frequent and watery. He gradually became weaker. For the following week he took powders composed chiefly of bismuth. These had no effect upon the diarrhea. Two days before entry he began to have a constricting feeling in his rectum, gradual onset of burning pain, and increasing difficulty in defecation. The stools were watery and for the first time contained flecks of bright red blood. As far as he knew he had never had any fever until this time. That evening however his temperature was 101°. A rectal examination which was extremely painful to the patient gave complete relief for about an hour. The pain however soon returned. He believed that he had lost about fifteen pounds in weight during the past month. There were no cardio-respiratory or genito-urinary complications.

His family and marital histories are irrelevant.

He was born in Massachusetts. At the age of nine months he went to the Philippine Islands, where he remained for three years. When he returned to New England he was very thin. His abdomen was described as being distended and he was known as a famine child. He had lived in New England ever since that time, except for a few short trips abroad. While in Europe eight years before entry he had an attack of diarrhea lasting about a month, accompanied by a dermatitis in both groins.

Physical examination showed a well developed and fairly well nourished man lying quietly in bed in no distress. He appeared to have lost considerable weight. There was slight injection of the throat. The heart was not enlarged. There was a blowing soft systolic murmur heard best at the base and poorly transmitted. The blood pressure was 105/85. There was marked voluntary spasm of the abdomen. No rectal examination was done.

Examination of the urine was negative except for a few bacteria in the sediment. Examination of the blood showed a red cell count of 4,780,000, a hemoglobin of 75 per cent, and a white cell count of 11,700, with 80 per cent polymorphonuclears. The stools were small in amount, liquid, red, neutral, and gave a 4 plus guaiac reaction. No amebae were seen, and no pathogenic organisms were grown on culture. The stools were examined for tubercle bacilli, but none were found. A Widal was negative. The non-protein nitrogen was 37, the serum protein 5.18.

The temperature was 99.2°, the pulse 90. The respirations were 22.

X-ray examination of the heart showed a downward prominence to the left. The diaphragm was moderately high, particularly on the left. The lungs were clear. A plain film of the abdomen showed gas in the stomach and colon. The gas in the stomach was more than usual, that in the colon extended from the cecum to the splenic flexure. The colon did not appear dilated. The haustral markings were present. There were several areas of calcification along the mesentery of the cecum. There was some gas in the true pelvis, probably in the rectum and sigmoid. There was no definite evidence of splenic enlargement. The hepatic flexure was moderately low.

The patient was put on a liquid diet without milk. The day following admission proctoscopic examination under spinal anesthesia revealed a fissure in ano. The rectum was dilated to four fingers, opening up the fissure into a V half an inch wide and three quarters of an inch deep. The apex of the V was a thrombus from a hemorrhoidal varix. A short proctoscope was passed and a considerable amount of liquid feces without blood was drawn out. A longer proctoscope was passed with some discomfort to the patient. After this a slight amount of blood due to trauma was withdrawn. No ulceration or growth was observed. Following proctoscopy his temperature rose to 103° and for the following week remained between 102° and 103°. He was given several transfusions, glucose intravenously and emetin hydrochloride one cubic centimeter subcutaneously daily for three doses. Twelve days after admission his temperature tended to go down but his pulse rose. Abdominal distention became marked. The abdomen was very tense and tympanitic. He was still receiving one cubic centimeter of emetin daily.

3 In the differential diagnosis there must be considered chronic inflammation and tumors of the perineum, scrotum, labium or anus

4 Treatment consists in complete extirpation. Postoperative irradiation is probably advisable with the malignant growths

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A COÖRDINATED PLAN IN THE CURRICULUM OF THE HARVARD MEDICAL SCHOOL

A new Professorship of Neurology has been created by the Governing Boards of Harvard University, and Dr Tracy Jackson Putnam has been named for this chair. Concurrently he has been appointed by the Trustees of the Boston City Hospital to take charge of the laboratories of the Neurological Unit. Dr Putnam has had years of training in his chosen field in Boston under Harvey Cushing, at the Johns Hopkins Hospital in Baltimore, and in various clinics abroad.

The Neurological Unit is a recent development at the Boston City Hospital. It includes two wards for neurological and neurosurgical patients, laboratories for the careful study of these patients and for research. There is an operating suite in these wards so that the surgeon in charge, Dr Donald Munro, can do his work under the best possible circumstances. At the present time Dr Abraham Myerson, Professor of Neurology at the Tufts College Medical School, and Dr Stanley Cobb, Bullard Professor of Neuropathology at the Harvard Medical School, are in charge of the Neurological Service. With the coming of Professor Putnam to the Neurological Unit, additional funds from the Harvard Medical School will be applied to work at the City Hospital, and it is expected that this newly created professorship, held by such an able clinical neurologist as Dr Putnam, will give new impetus to the study of organic diseases of the brain.

At the same time, with this announcement, comes the news of a large gift from the Rockefeller Foundation for the establishment and maintenance of a Psychiatric Unit at the Massachusetts General Hospital. This new departure brings to a great general hospital specialists in mental diseases to study these diseases in their early stages, as they appear in medical wards and in outpatient departments. A small ward will be opened for special treatment of early cases. This unit is to be under the direction of Dr Stanley Cobb. There will be close coöperation with the McLean Hospital in Waverley recently reorganized by Dr Tillotson and Dr Wood. In fact, the staff of the McLean Hospital is now to be incorporated in the staff of the Massachusetts General Hospital. Professor James B Ayer will be the neurological consultant.

At the Boston Psychopathic Hospital a group of Harvard investigators and teachers has long been studying mental disease under the guidance of Professor C Macfie Campbell. The new developments now add to his department clinics that supply important incipient psychiatric cases at the Massachusetts General Hospital, and the more difficult cases handled at the McLean Hospital. Research has been carried on for some years at the Boston Psychopathic Hospital under the immediate supervision of Professor Harry C Solomon. The Laura Spellman Rockefeller Foundation has given its patronage to this work, and the Commonwealth Fund has given fellowships which are administered by Professor Campbell. Dr Solomon is to have new laboratories which will be open for work by next autumn.

These changes are all part of a coördinated plan in the Harvard Medical School to bring into the Department of Diseases of the Nervous System opportunities to study all kinds of mental disease early and late, mild and severe, also all kinds of organic nervous disease such as the many brain injuries and infections seen at the City Hospital and the rare chronic diseases from all over New England that come into the Massachusetts General Hospital wards.

REDUCTION OF SERVICE AT MEMORIAL HOSPITAL, NEW YORK CITY

On the eve of its fiftieth anniversary the Memorial Hospital of New York has been compelled to close one of its important sections. Two years ago it began to alleviate certain forms of cancer by continuous irradiation with x rays for periods varying from several days to three weeks. In a room accommodating four at a time, 138 patients have been exposed with encouraging results to a high voltage x ray tube near the ceiling. The treatment is costly because of the character of the installation and because three special nurses are required. For lack of only \$5,000 a year the hospital has been forced to close this special room—one of the very few of its kind. It is not too late to help the hospital in making what is regarded as a distinct contribution to the treatment of growths which are beyond surgical aid and which resist other efforts to retard their spread.—*The New York Times*

yet this film taken in the lateral view is not suitable for discovery of free air below the diaphragm. The request was not of the usual type, and the technician misunderstood it. The request was for a lateral view and it should have been for an anteroposterior view with the patient lying on his side. In that way we should have found the air here probably. I thought that film over after the discussion with the surgeons and later in the afternoon started to write the note, and the longer I thought of it the more convinced I was that the patient had a perforation. The reason I saw both sides of the bowel became quite clear. I took it over to Dr. Holmes and he agreed, then we wrote that note. In the meantime the patient had been operated upon without my knowledge. We sent the technician up to get a film that would show free air. This is a lateral view of the abdomen with the patient lying on his back. He was too ill to move at that time. I am glad I had written this note before I saw this, because it is contradictory. There is no free air here apparently, but there is an explanation for that too. I think.

DR. DALAND. When we saw the patient we explained the lack of gas in the large bowel by the fact that just before the picture was taken he had a colonic irrigation, we thought we had washed the gas out of the large bowel, but he still had it in his small bowel.

At this time as at all times previously the man's peristalsis had been very sluggish. We did not think he was obstructed.

The patient was seen at this time in consultation with Dr. McKittrick. He did not make a positive diagnosis, but agreed that ileostomy should be done,—a desperate attempt to do something for the patient, but it should be made. So an ileostomy was done under novocain.

Instead of finding a very dilated small bowel we found no distention. On opening the peritoneal cavity there was nothing found except some cloudy fluid, but when we cut through the omentum which was stuck to the peritoneum there was a gush of gas and also a gush of a good deal of cloudy, milky fluid. The small bowel was not distended and it was with a good deal of difficulty that we were able to pull up a loop of small bowel to do an ileostomy. There was an exudate covering all the bowel that was seen.

The day before he died we still got negative guaiacs on the stools and negative guaiacs on the discharge from the ileostomy wound.

DR. CHESTER M. JONES. I cannot add much to the story as Dr. Daland has given it except that I remember when I saw the patient he had been here two or three days. The thing that struck me was that he had had a diarrhea of four or five weeks' duration with at that time elevation of temperature. The diagnosis was certainly not obvious and the cause of the

diarrhea had not been determined. We all felt he was seriously ill even at that time. In spite of the first apparently negative proctoscopy it seemed to me that one should consider three possibilities, tuberculous colitis, which Dr. Daland has mentioned, amebic dysentery, and possibly an ulcerative colitis, which with this distribution would have been a very unusual occurrence. We were not able to find evidence of ulceration in the rectum or rectosigmoid. I do not think we got really beyond the third valve. There was no frank ulceration. There was a little mucus that might have contained blood coming down from above, but it was so difficult to do the proctoscopy that it was not satisfactory.

In view of the calcified glands in the region of the root of the mesentery there seemed to be reason to consider tuberculous colitis, and because we did not know the cause of his diarrhea we felt that it was worth while giving him emetin on the chance that it might be amebic dysentery. My recollection is that he had six doses of emetin. Whether he had four or six makes no difference. We gave it as long as we could. As I look back on the cases of amebic dysentery we have had here that amount of emetin has produced a striking change in the diarrhea and a drop in temperature. There was a drop in temperature in this case, but no change so far as the diarrhea was concerned. While we did not definitely prove that he did not have amebic dysentery, we found no organisms and there was no change in the clinical picture.

In view of the autopsy findings I am amazed that we did not get more evidence in some stage of the disease so far as positive glands are concerned. I never saw the like before. To me it is still a case of unexplained diarrhea with perforation and hemorrhage.

DR. LELAND S. MCKITTRICK. I made no contribution whatsoever to that discussion at that time, and I cannot make much now. At the time I thought I had never seen but one patient so evenly distended as this one was. I remember we had a patient on Ward A who was tremendously distended and we did not know whether he had obstruction or peritonitis. That man had most of his gas outside the bowel and free in the peritoneal cavity. He had the same type of distention that this patient had. It is interesting that in this case also most of the distention should be caused by gas outside the bowel rather than gas inside.

I think it is very difficult at times to make a diagnosis of some of these acute diarrheas, particularly when they are desperately sick. It is difficult to follow the failure to show positive guaiacs. I have seen one or two cases in which I have been tremendously surprised at the autopsy findings. They have shown little or no blood clinically. I have wondered in

A plain film of the abdomen taken on the eleventh day showed a definite change since the last examination a week earlier. A loop of moderately dilated small bowel on the left side of the abdomen was clearly outlined by gas both in it and outside it, indicating free air in the abdomen and ileus of the small bowel. The gas in the colon was reduced in amount. In the lateral view of the abdomen air could be seen along the inferior surface of the diaphragm on both sides and three loops of small bowel were clearly outlined.

The following day an ileostomy was performed, followed by transfusion. X-ray films taken after operation with the patient lying supine showed gas in the small bowel, but no free air was seen between the bowel and the abdominal wall. Two 500 cubic centimeter transfusions of citrated whole blood were given the following day. Three stool examinations showed a negative guaiac. One examination the day before operation however had shown a 3 plus guaiac. Several cultures for amebae and other pathogenic organisms were negative. A second Widal test was done the day before operation and was negative. Blood cultures were all negative. On the day following the ileostomy he had a sudden gross hemorrhage from his rectum, losing about 500 cubic centimeters of blood. His blood pressure fell to 68/? He was irrational all that day. A slight bloody ooze from the rectum continued. After one transfusion it was decided not to transfuse any further. He died early the following morning.

CLINICAL DISCUSSION

DR ERNEST M DALAND The rectal pain was only an incidental thing. The diarrhea was more important than the rectal pain which he complained of at that time.

The evening of the second day before entry when his temperature was 101° was when I first saw him. His abdomen was easy to palpate. It was soft, and there was no tenderness and no spasm anywhere. A rectal examination made with a good deal of difficulty with my little finger did cause a great deal of pain, but it relieved his spasm for the period of about an hour.

The mother told me that the patient had definite signs of rickets while in the Philippines at the age of two, but it straightened out as soon as he got back to this country.

On the day following his admission to the hospital it was planned to do a proctoscopy under spinal anesthesia. That morning his temperature had risen to 103° by mouth, but the operation was done nevertheless. As soon as the spinal anesthesia was given it was very apparent that he had a fissure in ano, rather a triangular fissure measuring about three quarters of an inch across with a thrombus at the apex

of the triangle. This accounted for the gross blood that we had seen during the previous two or three days.

It was apparent at this time that while his immediate discomfort had been due to his fissure in ano, that was not the whole story and had not been the story during the two or three weeks previous to his entry to the hospital. Then the question came up as to what really was the diagnosis, so we made all the blood examinations.

X-ray examination of his chest was essentially negative. The only thing about the plain film that was abnormal was the evidence of old calcified glands in the region of the cecum, which we thought might mean that he had tuberculosis of the bowel.

DR AUBREY O HAMPTON Here is the first plain portable film of the abdomen. The descending colon contains only a few small bubbles of air. Here are the areas of calcification. These are not what we usually see as calcified glands, but this area is quite typical. We rarely see calcified areas that far laterally. It seems as if it were below the cecum or above it.

DR DALAND At about this time he developed distention. The diarrhea was very severe. He was receiving fifteen or twenty minims of deodorized tincture of opium after each stool, one day one hundred minims of this tincture of opium, without checking the diarrhea.

He was seen at this time by Dr Chester Jones, who was very much puzzled as to the diagnosis. We decided it was possibly a tuberculous peritonitis or tuberculosis of the cecum with a secondary peritonitis. The possibility of amebic dysentery was considered, and we had eight or ten examinations of the stools without seeing any organisms. We did not feel that we could make a definite diagnosis of ulcerative colitis, but a second proctoscopy was done with Dr Jones present and no definite ulcerations were found. There was some tenacious mucus found six or eight inches from the anus and when this was wiped off there was some redness of the mucosa but no definite ulceration. This mucus was examined while still warm and nothing found.

DR HAMPTON When we first discussed this second film a change was very obvious. It was not at all clear to me what had produced the change. We had a new gas shadow on the left side of the abdomen and this shadow which looked like a dilated loop of small bowel, and we could see the inside and the outside of this loop, whereas here in the first film you see only the inside of the small bowel. We never see the outside of the bowel when the gas is just on the inside of it. Here we have another view in which the loops both inside and outside are visible. We wondered about this air up here. It looks as if it were below the diaphragm, and

came so painful that she was forced to take only a small amount of liquid nourishment such as prune and orange juice, soups and occasional soft vegetables. Her physician diagnosed trench mouth and gave her a wash to use. One week later, following a three day bout of heavy drinking, mostly whiskey, she developed diarrhea, passing ten or twelve dark watery stools during the day and night. This was accompanied by straining, tenesmus and abdominal cramps. The anal and vaginal regions became very sore and irritated. About this time she noted the appearance of slightly painful sores and crustings on both hands and fingers but refused to bother much about them. About two weeks before entry her physician gave her some powders which stopped the diarrhea and produced some constipation. A dose of "ex-lax" started the diarrhea again, but it was fairly well controlled by powders. Recently she had been constipated occasionally. During this time she had also four attacks of gagging and vomiting of a small amount of liquid provoked by the thought of food. For the greater part of the past six weeks she had stayed in bed and had had "nothing to do with anyone." She had lost about forty pounds in the past year and approximately twenty pounds in the past seven weeks. Two days before entry there was a small show of red blood. There was no history of gas, belching, jaundice, abdominal swelling or hematemeses.

Marital history Her first husband deserted her after ten years. She had one living and healthy child by that marriage. She had been married to her second husband for sixteen years. There had been one miscarriage, no children.

Past history She had had no serious illnesses, and no venereal disease.

Physical examination showed an emaciated, apathetic, grossly dirty middle aged woman lying flat in bed expectorating frequently. The skin was very inelastic and showed extreme dryness. Over both hands and fingers were fairly symmetrical round fissured and crusted areas. None of these were present above the wrist line. The pupils were large, equal, and reacted sluggishly. There was generalized stomatitis consisting of a heavy gray exudate, and marked ozena. The heart was not enlarged. The sounds were of fair quality but rather tic-tac in nature. The blood pressure was 146/106. The liver edge was felt two fingerbreadths below the costal margin on deep inspiration. There was a moist area of erythema about the anus extending up to the vagina. There was considerable white vaginal discharge. Over both shins was slight bone tenderness.

The temperature was 99°, the pulse 100. The respirations were 20.

Examination of the blood showed a red cell count of 4,460,000 with a hemoglobin of 70 per cent. The white cell count was 7,000, with 70

per cent polymorphonuclears. Smears showed variation in size and shape of the red cells with moderate achromia. The platelets were normal. The neutrophils seemed poorly developed and young. The stools were small, fluid, and brown. Guaiac tests on three stool examinations were negative. Microscopic examination of a warm stool showed no parasites and a culture showed no pathogenic organisms. The non-protein nitrogen was 24 milligrams. The serum protein was 6 per cent. Hinton and Wassermann tests were positive. Two smears from the gums were negative for spirochetes.

She was put on a high caloric liquid diet. Her mouth was washed with sodium perborate. A dermatological consultant believed that the mouth lesions as well as the skin lesions were typically fungoid in character. Two days after admission, shortly after intravenous ten per cent glucose, she became somewhat delirious, requiring morphia and scopolamin to quiet her. Several hours later she was observed to be breathing rapidly and to hold herself more or less rigid. Her pulse became very weak and her respirations irregular. She died early the following morning, three days after admission.

CLINICAL DISCUSSION

DR. FREDERICK T. LORD: The striking features were the history of alcohol and insufficient diet, the diarrhea, dehydration, sore mouth, the skin lesions, and the mental state, making it difficult to communicate with her. Pellagra seemed the most likely explanation. The skin lesions were, however, not typical of the pellagrous erythema. Though present on both hands, they were asymmetrically disposed and more elevated and crusted than is usual with pellagra.

In view of the diarrhea and the bloody stools, colitis is also a possibility. We were interested in the suggestion by Dr. Swartz that she might have a fungus infection.

DR. J. H. SWARTZ: I saw this case and was particularly interested in the mouth, which showed membranous adherent lesions on the tongue and the buccal mucous membrane, rather the type of condition that is not seen in pellagra. One might see these in a deficiency disease plus a superimposed fungus infection. It was quite characteristic of monilia infection of the mucosa. On examination of the skin she did not have symmetrical lesions. Instead of having the atrophic type of skin with pigmentation seen in pellagra, she showed irregular verrucous patches occasionally seen with monilias. I have in mind two cases, one an adult and one a young boy, both of whom showed similar lesions on the skin with the typical mouth lesion seen in this patient. In this case material from the mouth lesions grown on Sabouraud's media showed a pure culture of monilia. Unfortunately the house officer failed to get material from

thinking them over whether one might not get in some of these extensively diseased large bowels areas that really amount to necrosis with thrombosis of some of the smaller vessels, just as one may get an area of necrosis on a diabetic foot. This avascular slough may erode a vessel separate, and then give massive hemorrhage. Certainly we have seen these large intestines with the mucosa almost gone with clinically practically no demonstrable blood by rectum.

CLINICAL DIAGNOSES

Tuberculosis of the ileum with perforation
Tuberculous peritonitis
Intestinal hemorrhage

ANATOMIC DIAGNOSES

Acute colitis with ulcerations and perforation, etiology unknown
General peritonitis
Hydrothorax, bilateral
Operative wound, ileostomy
Adenomatous polyps of the sigmoid

PATHOLOGIC DISCUSSION

DR TRACY B. MALLORY: The autopsy, except for proving that the man had a very severe grade of colitis and of course a perforation and peritonitis, really tells us nothing.

Nearly the entire colon showed enormous ulcers, some of them ranging up to four centimeters in diameter. These were rather sharply punched out. Some of them had a perfectly clean base. Others showed a necrotic slough in the center of the ulcerated area. The ulcers graded down in size to as small as two millimeters in diameter. The process was rather irregular in its distribution and involved the lower end of the large intestine to the least extent. The lowest ulcer was just at the recto-sigmoid junction, barely within the region of the proctoscope. There were no ulcers in the rectum itself.

The general character of the bowel, with relatively normal looking mucosa between the large ulcers, was totally different from that of any ordinary case of chronic ulcerative colitis. I felt on the gross appearance that that seemed a very improbable diagnosis. We made very thorough and careful bacteriologic studies and could not pick up any organism that seemed of the slightest significance and that might not be found in any ordinary bowel. Neither the immediate examination nor the sections have shown anything remotely suggesting amebae. With even more confidence we can rule out tuberculosis, which is quite easy to identify in the intestinal tract.

The absence of blood in the stools is difficult to explain. Although thrombosed blood vessels were found in some of the ulcers, others showed widely dilated capillaries and interstitial hemorrhage in their walls.

DR CHARLES L. SCUDDER: Could it be determined at autopsy where the perforation took place? Was it at the base of one of these ulcers, or was that impossible to determine?

DR MALLORY: In the course of doing the autopsy we discovered as many as half a dozen gross defects. The whole bowel wall was so necrotic that everywhere we touched it it fell apart at the bases of these ulcers, so we felt a little uncertain as to whether two or three had perforated before we started handling the bowel, or many more.

DR SCUDDER: Might the hemorrhage have been of mechanical origin?

DR MALLORY: It might have been. At the time of autopsy there were numerous perforated ulcers and others on the verge of perforation, so that the slightest touch would cause it.

DR HAMPTON: The x-ray appearance was quite unusual. I want to try to explain why we could not make a diagnosis of free air in that last film, the one taken in the position we usually use to show free air, that is with the patient supine in the lateral view of the abdomen. The air was not free, it was trapped by the omentum, and that is the reason it gave such a queer picture. If we are to accept the x-ray findings in the second examination there is evidence of a perforation in the left colon around the descending portion somewhere. There is no free air on the right side.

DR JONES: I suppose the most logical conclusion is that he had ulcerative colitis of the very fulminating type with unusual distribution rather than with the usual lesions in the rectum. The case is like one or two cases that we have had starting in the rectum that progressed very rapidly and perforated.

DR MALLORY: I should not feel satisfied with that because the appearance of the bowel was so entirely different. Even the fulminating cases look a good deal like chronic colitis, and do not have the punched out ulcers that we have here.

DR JONES: The discreteness of the ulcers makes it more like an amebic colitis than anything else, does it not?

DR MALLORY: In appearance, yes.

CASE 20132

PRESENTATION OF CASE

A forty-seven year old married night club hostess entered complaining of diarrhea, stomatitis and weakness of six or seven weeks' duration.

A year before entry the patient increased her use of alcoholic liquors from an occasional sociable drink to an average of one pint of whiskey or beer every night. At the same time she ate poorly and took very little meat. She began to lose strength and weight and became very nervous. Seven weeks before entry she developed sores on the roof and sides of her mouth, beneath the tongue and on the gums. These be-

which is very suggestive, but probably cannot be regarded as conclusive evidence of pellagra. Perhaps clinical and pathologic studies of other similar cases will tell us whether they are pellagra or some other deficiency disease.

DR M B STRAUSS I am interested in the mouth lesions, which I think are commonly called thrush and which are said to be due to a monilia or other fungus. In Dr Castle's experience in Porto Rico a case considered to be thrush was cured by the intramuscular injection of liver extract, the mouth lesions healing completely.

I think that the atrophy of the colon is quite consistent with pellagra. Whether the pellagra is secondary to the diarrhea or the diar-

rhea a manifestation of pellagra is fairly difficult to say.

DR SWARTZ I think there are two types of monilia infection of the mouth, the one which Dr Mallory just mentioned, which is solely due to a vitamin deficiency and which improves with vitamin and high caloric diet. Then we have the type which the dermatologist sees and which usually comes to postmortem examination. The two cases I mentioned were on high vitamin diet, but without change. In the first type one does not find a pure culture of monilia, but an occasional colony. In cases of the second type one gets a pure culture from the lesion in the mouth. They are the cases that are resistant no matter what the treatment may be.

the skin for me Stool cultures were ordered but were not done

I am not an internist, but I feel that the whole picture may be explained by fungus infection similar to sprue, and the lesions in the skin and mouth fall under one diagnosis I do not doubt that vitamin deficiency may be an underlying cause

It will be interesting to know what the post-mortem examination of the fluid found in the abdomen will show

DR CHESTER M JONES I think it is not uncommon in these severe diarrheas to get such a mouth condition as is described here A fairly good proportion of cases in this ulcerative colitis group have such mouth lesions and marked stomatitis, and we do not get a monilia growth from the mouth in these cases I have always felt that the mouth disturbance was a result of dehydration and malnutrition. Of the skin lesions I have no knowledge at all

CLINICAL DIAGNOSES

Pellagra
Dehydration

ANATOMIC DIAGNOSES

Pellagra
Multiple ulcerations of the colon chiefly localized to the cecum and transverse portion, with perforation
Generalized purulent peritonitis
Dermatitis
Glossitis
Apical fibrosis
Arteriosclerosis, slight aortic
Calcified retroperitoneal glands

PATHOLOGIC DISCUSSION

DR TRACY B MALLORY The autopsy on this patient showed besides the skin and tongue changes which have already been mentioned a very severe colitis which was peculiar in character There were two patches of multiple confluent ulcers, each patch measuring about 8 centimeters in length, one in the cecum and the second in the transverse colon, fairly near to the splenic flexure This segmented distribution goes far towards ruling out ordinary ulcerative colitis The final event which caused her death was the perforation of three of these ulcers in the colon

The diagnosis in the case is obviously still in doubt My personal impression is that it is probably consistent with pellagra, since focal ulcers in the large intestine are described as being characteristic of that disease, and the glossitis and dermatitis certainly fit the picture

The skin lesions certainly were atypical in distribution They showed chiefly a hypokera-

tosis without evidence of pigmentation, but by perkeratosis is found in pellagra. The tongue showed a very peculiar vascular granulation tissue beneath the epithelium with practically no inflammatory response whatever

The finding of monilia to my mind would not prove the point one way or the other I think the work of Castle and Rhodes in Porto Rico pretty conclusively proved that monilia has nothing to do with the etiology of sprue, although very regularly found in the disease

The liver showed more fat Tremendous numbers of fat vacuoles are visible I think that could possibly occur in pellagra, but her history of very heavy alcoholism would be an equally good explanation for it

The intestinal lesions show very sharply punched out ulcers which go to and often through the muscularis The intervening mucous membrane is quite peculiar in character In one low power field there are only five intestinal glands There would normally be twenty or thirty in an area of that size, so that marked atrophy of the mucosa must be present Further evidence pointing toward pellagra is provided by Dr Kubik's findings

DR CHARLES S KUBIK In the large pyramidal cells of the cerebral cortex there are changes which resemble axonal reaction The cells have a swollen appearance, their central portion is pale, glassy looking, there is only a narrow marginal zone of Nissl substance, nuclei are flattened and displaced to the periphery

Special stains for myelin, fat and glia reveal no degeneration or gliosis in the fiber tracts of the spinal cord Scattered rounded and elongated cells containing deposits of fat are found in the posterior roots No degeneration is found in the peripheral nerves

In most cases of pellagra that come to post mortem examination only the findings in the central nervous system are at all characteristic In two cases examined here and in most of the reported cases there have been (1) changes in the large pyramidal cells of the cortex identical with those found in the case before us, and (2) degeneration in the posterior columns of the spinal cord, most marked in the columns of Goll I believe that cases have been described in which there was no disease of the spinal cord. Degeneration of peripheral nerves has been observed but was not present in our cases

The findings in the posterior roots in the present case are slight but definitely abnormal and probably indicate early disease They are of some interest in connection with the views of certain writers who believe that the cord changes of pellagra are to be explained by primary disease of the posterior roots with resulting secondary degeneration of the posterior columns

In this case, therefore, we have pathology

Boston Herald of Sunday, that although the survey board which advised the Mayor with regard to the budget of the Health Department proposed the discharge of some nursing personnel as a means of economy, sufficient money will be available to retain them.

We hope that his Honor the Mayor will consider the appointment of a small group to serve without pay as a permanent Health Council for Boston. The Health Department of the State has long had such a council and its value has never been questioned.

Moreover, if considerable reduction in the budget of the Health Department of the City of Boston is to be made without great detriment to the vital services rendered by that Department, it appears certain that a sweeping reorganization is inevitable. The kind of reorganization that we visualize would involve curtailment of personnel and, probably, a few replacements. When curtailments of personnel are required, the gaps can be bridged only by improved organization and better service. Consequently, the interest of the community demands more urgently than ever before that all the officials retained in the Health Department shall fully measure up to the requirements of their respective positions. The best possible health service for which the community can pay is none too good for Boston. The place of residence of well-qualified persons is unimportant. The real questions are those of willingness to serve, character, training and ability. Mayor LaGuardia of New York has demonstrated his belief in this principle. With all New York to choose from, he considered available men from all over the country and finally took his Health Commissioner from New Haven.

Should a reorganization of the Health Department be undertaken in order to effect necessary savings and, also, to enhance efficiency, every citizen should uphold him who undertakes it. Let no one forget that when inefficient personnel are employed in a health department, the resulting loss in dollars is insignificant as compared with the cost which is paid in disease and death.

THIS WEEK'S ISSUE

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ROGERS, HORATIO A.B., M.D. Harvard University Medical School 1923. F.A.C.S. Assistant Surgeon to Outpatients at the Massachusetts General Hospital and member of Fracture Service. Assistant Visiting Surgeon, Pondville Hospital. Assistant Surgeon, Faulkner Hospital. Visiting Surgeon, Vincent Memorial Hospital. Consulting Surgeon, Massachusetts Eye and Ear Infirmary, and Henry Heywood Memorial Hospital. Assistant in Surgery, Harvard Medical School. His subject is "Dislocation of the Shoulder—An End-Result Study." Page 679. Address: 264 Beacon Street, Boston, Massachusetts.

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BARGEN, J. ARNOLD. B.S., M.S., M.D. Rush Medical College 1921. F.A.C.P. Associate in Section of the Division of Medicine, The Mayo

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FORCED GRASPING THE SIGN AND THE SYNDROME

THE signs of clinical neurology, like positive laboratory findings, are often regarded rather superficially as isolated entities pointing to the existence of a specific disorder. Without much thought one associates a Charcot knee-joint with tabes, an up-going toe with an "upper motor neurone lesion" or perhaps more specifically with a lesion of the pyramidal tract, and there is danger lest the present interest in the grasp reflexes will cause forced grasping to be regarded as just one more localizing sign with little appreciation of the nature and real significance of the phenomenon. It is clearly important that a lesion restricted to the premotor area of the cortex gives rise to forced grasping. The case reported and fully discussed in this number by Dr Viets indicates that forced grasping is not an isolated sign, but rather a single manifestation of a profound disturbance of the postural reflex mechanism. Far too little is known about the relation of the cerebral cortex to the postural reflexes, and of the postural

reflexes to the volitional mechanism, but it is clear that if neurologists follow Dr Viets in seizing their opportunities to study the total syndrome, presented by such cases, it will contribute to a real understanding of the basic physiological mechanism involved, and it will also foster a less superficial approach to problems of clinical neurology.

THE USE OF THE HINTON TEST

For the past ten or fifteen years increasing dependence has been placed on the so called flocculation or precipitation methods for the serological diagnosis of syphilis. Various procedures have been devised for this purpose. At first the major claim for these methods was their simplicity as compared with the Wassermann test, but of late years the precipitation methods have been improved so that they have demonstrated their superiority to the Wassermann in both sensitivity and accuracy. Precipitation tests are now in use in the Army and Navy as well as in most of the larger laboratories.

For these reasons Doctor Chadwick's letter* announcing that the Wassermann Laboratory of the Department of Public Health will routinely use the Hinton test in place of the Wassermann should be considered a step forward. Because of its unusually high degree of sensitivity and, even more important, because of its almost complete specificity, the Hinton test has been recognized as one of the best of the precipitation methods. The change appears to be a highly desirable one.

*Page 711

REORGANIZATION OF THE HEALTH DEPARTMENT IN BOSTON?

THE evening papers of a few days ago announced the fact that His Honor the Mayor of Boston had invited three eminent experts on public health administration to advise him about the budget of the Health Department of the City of Boston. Those named were

Wilson G. Smilie, M.D., Dr.P.H., Professor of Public Health Administration, Harvard School of Public Health

Clair E. Turner, Dr.P.H., Professor of Biology and Public Health, Massachusetts Institute of Technology

Sophie C. Nelson, R.N., Director of Visiting Nurse Service, John Hancock Mutual Life Insurance Company, and President of the National Organization for Public Health Nursing

We wish to congratulate His Honor on having consulted persons so well qualified to advise him on this important matter.

It is gratifying to note, as reported in the

birth. The building of the temporary dentition, or baby teeth, is almost entirely completed during pregnancy. Consequently the mother's diet during this period is of prime importance. Not only should she see her obstetrician as often as he requires, but she should pay regular visits to her dentist. The family dentist can protect her own teeth and also ensure a proper background for building strong teeth for the infant. After the baby is born, thought must be directed to its future dental needs. During the first six years of life—the pre-school period—the permanent teeth are being calcified and dietary supervision is most important. As soon as is feasible, but at least as early as three years of age, the youngster should be taken to the dentist. Decay of the teeth is apt to be quite active during childhood, and by examination, cleaning and care, the dentist can do much to preserve the baby teeth until the permanent ones arrive later. The baby teeth should never be neglected on the grounds that they are lost anyway and are of little consequence, because dentists know that failure to preserve the baby teeth may cause all manner of trouble with the permanent teeth to come.

During the early years of school, between six and twelve years, the child's mouth passes through a period of transition, when the baby teeth are gradually lost, one by one, and replaced by the permanent dentition. Frequent visits to the dentist should continue because not only must decay be watched for, but growth and development must be supervised. A great deal of orthodontia or straightening of the teeth is done these days and it is an important part of the program to give the growing child a good dental apparatus but by his examination during the early years of life the dentist can detect conditions which if neglected will cause crooked teeth and irregular jaws and can take steps to prevent serious consequences.

The adolescent years from twelve to eighteen bring with them a period of high susceptibility to tooth decay. As in the previous periods constant professional supervision is necessary and careful attention to the child's diet is imperative. Scientific evidence seems to point to the fact that tooth decay is a deficiency disease indicating the lack of some elements from the diet. Exactly what those elements are we do not know but we do know that emphasis upon the foods containing calcium, phosphorus and the vitamins will produce extraordinary results in halting the progress of decay, and as previously stated milk, eggs, fresh fruits and vegetables and certain quantities of meats are just these foods.

After the individual has reached mature years, the dental problem resolves itself into the maintenance of health in the mouth and the forestalling of those degenerative changes of the teeth, gums and jaw bones known as pyorrhea. If a comprehensive sound program of dental care has been followed during infancy, childhood and youth the individual's dentist has an excellent chance to keep his teeth healthy for the remainder of his life. And conversely,

without such care in the early years, the possibilities of avoiding serious trouble later are very slim.

Prevention, therefore, pays a premium. The responsibility rests upon everyone, but particularly upon the parents of children. Give the youngsters a chance for healthy mouths. And don't forget that to make prevention effective, it must be begun in infancy and followed faithfully throughout life.

ALLEGED FALSELY AND FRAUDULENTLY LABELED MEDICINES

The United States Department of Agriculture has been active in seizing medicines and foods which are not correctly labeled.

In the list, one of major importance was the preparation with the designation of "Sirop d'Anis Gaurin Compound" consigned by J. A. E. Gaurin, Lowell, Massachusetts, to consignees in Providence, R. I., and recommended for coughs, colds, and bronchitis.

The Government alleged that this preparation contained morphine and was used largely by mothers working in textile mills in New England towns. These parents in certain instances gave this compound to young children before going to work so as to keep the infants quiet, to be repeated at noon.

Several less potent drugs have been seized because of adulterations and misbranding.

AN HONOR TO DR. WILINSKY

Dr. Charles F. Wilinsky, deputy health commissioner of Boston, in charge of the Health Units of Boston and Director of the Beth Israel Hospital, has been appointed to make a hospital and health survey of St. Louis.

Dr. Wilinsky is recognized as an expert in the administration of health activities.

CORRESPONDENCE

THE STATE DEPARTMENT OF PUBLIC HEALTH AND THE HINTON TEST

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

March 16, 1934

Editor, *New England Journal of Medicine*,

For the past eighteen months this Department has been considering substituting the Hinton for the Wassermann test in the serological detection of syphilis. Recognizing that such a change should be made only after due consideration, letters were sent to various large laboratories and prominent syphilographers in different parts of the country in order that the Department might have the benefit of their experience. After their replies had been studied the opinions of local clinicians and serologists were obtained. It was found that in general the precipitation methods (Kahn, Hinton, etc.) are considered superior to the Wassermann test and are used in

Clinic, and Assistant Professor of Medicine, The Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota Address The Mayo Clinic, Rochester, Minnesota Their subject is "The Neoplastic Factor in Chronic Ulcerative Colitis" Page 692

SHEEDEN, W M M D Harvard University Medical School 1920 F A C S Chief, Tumor Clinic, Boston Dispensary Assistant Surgeon to Outpatients, Massachusetts General Hospital His subject is "Neoplasms Originating in the Ischiorectal Fossa with Particular Reference to Sarcomata" Page 696 Address 270 Commonwealth Avenue, Boston, Massachusetts

MISCELLANY

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

PREVENTION PAYS A PREMIUM*

BY LEROY M S MINER, D M D, M D
Dean, Harvard University Dental School

Reliable statistics tell us that about one hundred million people in the United States are afflicted with some form of dental disease, and that more than ninety per cent of the children of school age exhibit tooth decay "What of it?" you may ask. 'A lot of it,' is the reply, for modern dental and also medical science are now fully aware of the havoc which can be wrought upon the health of the whole body by neglecting to maintain health in the mouth The principal dangers are not obvious at first glance, and consequently are not recognized as important until further examination of the facts is made Normally we are quite prone to think of tooth decay as a relatively simple and harmless thing It does not kill people as do pneumonia and tuberculosis It does not maim people as does infantile paralysis Regarded on such a basis, it does not appear to warrant grave concern, nor should its enormous prevalence be viewed with alarm

Yet leaders in the medical and dental professions are only too painfully aware that the above-mentioned narrow view does not reflect the truth It does not even approach the truth John Hunter, a great English physician in the Eighteenth Century, wrote, 'One might at first imagine that the diseases of the teeth must be very simple', but experience shows the contrary The teeth, being singular in structure, have diseases peculiar to themselves These diseases, considered abstractedly, are indeed very simple, but by the relations which the teeth bear to the body in general, and to the parts with which they are immediately connected, they become extremely complicated" Thus spoke John Hunter'

And these words are just as true today as they were when they were written The baneful effects of abscessed teeth and pyorrheal degenerations of the gums are being appreciated by many more people than ever before Rheumatism, heart trouble, kidney trouble, and numerous obscure conditions have been attributed to decayed teeth and diseased gums The scientific basis for such a belief is the clinical experience of many physicians and dentists In thousands of cases these obscure diseases have shown marked improvement following the extraction of diseased teeth and the removal of infection from the mouth

But the enormous extent of dental disease throughout the United States, previously referred to, raises difficulties which oblige us to modify our point of view At first thought one is tempted to urge the building of more and more clinics to handle the vast numbers of population affected by dental disease. Yet to perform the service of treatment on such a scale as this would necessitate the training of five times as many dentists as we have now and would require the expenditure of a fabulous sum of money to make it possible The futility of attacking this problem on a basis of treatment thus becomes quite obvious It cannot be handled by treatment, tooth by tooth, mouth by mouth "But how? How?" you ask. The answer is *PREVENTION*—the same answer that has been given in the past to other scourges attacking large masses of people, such as typhoid fever, yellow fever, malaria, and so forth

To prevent disease we must know its cause As yet neither medical nor dental science has revealed the cause or causes of dental disease—whether tooth decay or pyorrhea But many important facts have been assembled which appear to point the way Much can be done today to forestall the occurrence of disease in the mouth, provided adequate care is begun early enough in life and continued faithfully throughout life

There are three essential points to the proper care of the mouth (1) proper brushing of the teeth at least twice a day (2) regular visits to the dentist, (3) adequate supervision of the diet Brushing of the teeth is very important because the removal of food debris from the nooks and crannies of the teeth and around the gums will minimize the opportunities of bacteria to attack the tissues Yet brushing is not the whole story The old adage, "A clean tooth never decays", we now know not to be wholly true In addition to cleanliness of the teeth, careful supervision of the diet, with emphasis upon milk, eggs, fresh fruits and vegetables (the so-called protective foods) will go far toward keeping the mouth and teeth healthy and toward building up resistance to dental disease Regular visits to the dentist give him the chance to check up on the condition of the mouth, and by his early recognition of disease in its incipient stages, much serious trouble at a later date can be precluded

The establishment of a program of prevention for any individual ought properly to be begun before

ly for the patients and the Hospital and always carrying out faithfully any assignments given him. He was a perfect 'team worker' and never an individualist.

We doubt if anyone ever heard him make an unkind or critical remark about a colleague. It was not in him to do so.

His surgery was of the highest quality and characterized by sound judgment, finished technique and excellent results.

From 1924 to 1930 he served as Clinical Professor of Surgery in the Harvard Medical School and as Surgeon in Chief of the Harvard Teaching Service in the Boston City Hospital.

He did not desire this appointment and accepted it solely out of loyalty to the School and Hospital. Having once accepted he personally did most of the teaching and carried it on long after he was unable to operate.

He bore his physical sufferings and limitations with wonderful patience and fortitude. When he should have been in his prime he found himself the victim of a combined joint and neurological complex that aged and crippled him long before his time and made active surgery and practice impossible. And here again the man's character shone forth magnificently. We doubt if anyone ever heard him make one complaint about his physical condition and pain and yet he suffered greatly.

We who were his colleagues are the better for having known and worked with him. He was a real asset to this Hospital of ours and his loss is a great one.

P. F. BUTLER

Secretary Senior Staff

March twenty-two

Nineteen hundred and thirty-four

NOTICES

BOSTON MEDICAL LIBRARY

EXHIBITION

The Library is showing a number of manuscripts incunabula and other early books on Jewish medicine and medical books in Hebrew. They are all selections from the Solomon M. Hays Collection and consist of fifteen manuscripts, fifteen incunabula and fifteen other early printed books.

The manuscripts consist of four in Latin, one in Arabic and ten in Hebrew. Three are of the 13th, one of the 14th, ten of the 15th and one of the 17th centuries. Of outstanding importance are the Canon of Avicenna, in Arabic, dated 1309, the very fine 'Viaticus' of Constantinus Africanus in Latin about 1250, the two Latin manuscripts of Isaac Judaeus both of the 13th century. The small collection of ten Hebrew manuscripts is very important and it contains a complete 'Lilium' of Bernardus de Gordonio dated 1468 and a unique copy of the translation of Nathan ha Meati of the Liber ad almansorem of Rhazes.

The books are notable containing the complete Hebrew Avicenna of 1491, the Commentary on the Pentateuch of Levi ben Gershon Mantua (1475-76), one of the two first books printed in Hebrew, the excessively rare Annulus astronomicus of Bonetus de Latis (Rome about 1492-93) said to contain the first picture of a scientific instrument, an edition of the Expositio somniorum Danielis (Memingen about 1495) and an extraordinary rarity in the Historia completa of Johannes Mathias Tubertinus Trent 1476.

In addition there are being shown selections from the Handapparatus of the great Jewish physician and scientist August Wassermann which have been recently acquired for the Hays Collection.

The exhibition will be continued until April 15.

RADIO HEALTH MESSAGES

MARCH, 1934

Sponsorship Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.

Courtesy WBZ Fridays, 4 30 P M

March

30 Résumé of the Year's Work

HEALTH QUESTION BOX

Sponsored by Massachusetts Department of Public Health. Fridays, 4 40 P M

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI Fridays, 5 00 P M

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

SPECIAL

Courtesy WEEI. Fridays, 1 15 P M

Glimpses into the History of Public Health in Massachusetts together with the Functions and Activities of the Massachusetts Department of Public Health Blended with Classical Music.

REPORTS AND NOTICES OF MEETINGS

THE WILLIAM HARVEY SOCIETY

Dr. Irving J. Walker, Clinical Professor of Surgery at Harvard Medical School, addressed the William Harvey Society on Friday evening, March 9, choosing as his topic 'Judgment and Conscience in Surgery'.

In opening the speaker stated that we deal with a great variation in inherent ability of surgeons as in all other fields of human endeavor and as is usually the case, those of greater natural endowments obtain the finest training because they are accepted by the best medical schools and hospitals.

several state and private laboratories and by the Army and Navy

It would be ideal to make two or more tests so that one could be checked against the other. However, this is impossible with our present laboratory personnel, and it has been decided to use the better test, namely, a precipitation test. Accordingly the Department voted, on March 13, 1934, that after April 2, 1934, the Hinton test shall be performed instead of the Wassermann test on all specimens submitted for serological detection of syphilis when the specimen is suitable for testing by this method. In general, blood serums will be tested by the Hinton method, but the Wassermann test will still be used for spinal fluids since these cannot be efficiently tested by the Hinton or other precipitation tests.

More than 80,000 Hinton tests have been done at the Wassermann Laboratory and the Boston Dispensary during the past several years and checked against other tests. The Hinton test is much more sensitive than the Wassermann or any of the standard precipitation tests with which it was compared. With the use of the Hinton test the detection of syphilis will be greatly simplified. Fortunately its greater sensitivity is not accompanied by decreased specificity and, therefore, the danger of falsely positive tests is not increased.

The Hinton test is to be interpreted exactly as the Wassermann test has been interpreted. Its advantage to both physician and patient lies in the fact that the Hinton test becomes positive much earlier in syphilis and remains positive longer. Thus treatment may be begun earlier, which is of great advantage to the patient, and will be continued longer with the result that it will be more nearly adequate. Furthermore, pneumonia, jaundice and rheumatic fever, which not infrequently cause false positive Wassermann reactions, have no effect upon the Hinton test.

Yours truly,

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health

A PROBLEM IN STATE MEDICINE

Town of Winchester
Massachusetts
Office of
Board of Health

March 23 1934

Editor of the *New England Journal of Medicine*,

Criticism of the cost of private medical care has been widespread, vigorous and fashionable in recent years. Many health officials and sociologists would have us believe that lessened cost would result by increasing state participation and supervision in the practice of medicine. Let us consider a specific instance of state medicine and judge from actual figures how economical and efficient the result is.

The Middlesex County Tuberculosis hospital was built in Waltham about three years ago. Although the Town of Winchester was never consulted the

bill to the town for its share of the initial cost of this hospital was a little over \$60,000. At five per cent the interest charge on this amount from now on is \$3000. In 1933 the county bill to Winchester for its share of the maintenance of this hospital was \$4553.80. In addition, the Town paid to the county in 1933 \$1655.50 for the care of its patients for 135 weeks. Thus the total cost to Winchester in 1933 for 135 weeks of hospital care was \$9209.30 or at the rate of \$68.21 per patient per week.

For \$68 every patient could have stayed at home and could have been provided with food, a private nurse and adequate private medical care. For \$68 every patient could have had a private room in a private hospital with adequate nursing and medical care.

Nor do we have prompt and efficient service as a solace for this tremendous weekly cost rate. Since the first of the year we have had only one patient in the hospital with two urgent cases on a waiting list that is four months behind.

J. HARPER BLAISDELL, M.D., *Chairman*

DEATH

A DELAYED NOTICE

COTTRELL — SAMUEL SMITH COTTRELL, M.D., died July 16, 1933. He was born in Richmond, Virginia, November 12, 1889. He received his degree of M.D. from the Boston University Medical School in 1914.

He entered the field of psychiatry in 1921 at the Milwaukee Hospital for Mental Diseases, and later served at the Bloomingdale Hospital, White Plains, New York, from 1922 to 1924, and the National Hospital, London, England, 1924-1927. In 1927 and 1928 he attended psychiatric clinics in France, Switzerland and Italy. He was assistant superintendent of the Medfield State Hospital, Harding, Massachusetts, from 1928 to 1931 and after that was chief executive officer at the Boston Psychiatric Hospital until his death. He was a member of the New England Society of Psychiatry, Massachusetts Psychiatric Association, American Psychiatric Association, Massachusetts Medical Society, and the New York Medical Society.

Dr. Cottrell is survived by his widow, Mrs. Mae Weeks Cottrell, and three children.

OBITUARY

THE BOSTON CITY HOSPITAL

RESOLUTIONS IN APPRECIATION OF DR. JOSHUA C. HUBBARD

In the death of Dr. Joshua C. Hubbard January 9, 1934, this Hospital has lost a man of sterling character, sound surgical judgment and extraordinary personal charm. Coming here after his training at our Sister Institution, the Massachusetts General Hospital, he immediately became a loyal and devoted 'City Hospital Man' working untiringly

with perhaps some differences in regard to the time of doing spinal fusions in tuberculosis. A few slides were shown at the conclusion of the talk, depicting some of the actual operations seen, and then Drs Osgood, Smith Petersen, and Cotton briefly discussed the paper. All the speakers emphasized the importance of considering the local conditions and factors in the evaluation of the work and methods of any clinic anywhere.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

CENSORS' MEETING

Middlesex South District Medical Society. Notice of Censors Meeting at the Boston Medical Library on May 3, 1934. Any Fellow of this Society who knows of potential candidates for membership is asked to have them communicate with the Secretary at once.

ALEXANDER A. LEVI, M.D., *Secretary*

INTERNATIONAL UNION AGAINST TUBERCULOSIS

The Ninth Conference of the International Union against Tuberculosis (Secretary General Prof. Léon Bernard) will meet in Warsaw on September 4, 5 and 6, 1934 under the high patronage of H. E. the President of the Republic of Poland and under the Chairmanship of Prof. Pieztrzynski, President Elect of the International Union. The discussion will be limited to three main subjects: Biological 'Biological variations of the tubercle virus', Opening report by Professor Karwacki (Poland); Clinical 'Tuberculosis of the bones and joints', treatment medical and surgical. Opening report by Professor Putti (Italy); Social 'The use and organization of tuberculosis dispensaries'. Opening report by Professor Léon Bernard (France). Ten speakers selected in advance from a list presented by the 43 countries belonging to the Union have been designated to open the discussion on each of the questions on the agenda.

The Organization Committee of the Conference has prepared a very attractive program of receptions and excursions; the latter will enable members of the Congress to visit the chief anti-tuberculosis institutions as well as the most picturesque scenery in various parts of Poland.

Members of the International Union are invited to take part in the Conference free of any contribution fee. They may forward their application either through the medium of their Government or their National Association against Tuberculosis or directly to the Organizing Committee in Warsaw, at the following address:

Organizing Committee of the Ninth Conference of the International Union against Tuberculosis, Chocimska Street 24, Warsaw, Poland.

Persons who are not members of the Union and who wish to take part as 'Members of the Confer

ence' must forward their application together with a contribution fee of 50 zlotys, exclusively through the medium of the National Tuberculosis Association, New Nelson Tower Building, 450 Seventh Avenue, New York City.

Reductions on hotel prices and railway fares will be granted to Members of the Congress.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinico-pathological conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, at 7:30 P.M., on Thursday, April 5, with the following program: Three cases of Muscular Dystrophy, Illustrated by Moving Pictures; Bone Tumor of the Knee, Discussed by Drs. Katzeff and Leary; Sudden Cardiac Decompensation, Without Previous Evidence, Discussed by Dr. Lyle. The regular business meeting of the staff will follow.

ALICE H. BIGELOW, M.D., *Secretary*

NEW ENGLAND ASSOCIATION OF THE JOHNS HOPKINS ALUMNI

The annual meeting of the New England Association of the Johns Hopkins Alumni will be held Saturday evening, April 14, at the University Club, Boston. Dinner will be served at 7 P.M. Dr. E. K. Marshall, Jr., Professor of Pharmacology, will address the meeting after the dinner.

MARSHALL FULTON, M.D., *Secretary*
721 Huntington Avenue, Boston.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, April 10, at 8:15 P.M.

PROGRAM

Presentation of Cases

The Incidence, Etiology and Treatment of Nutritional Anemia. By L. S. P. Davidson, M.D., F.R.C.P.E., F.R.S.E., Professor of Medicine at the University of Aberdeen.

Dr. George R. Minot will preside.

JOHN HOMANS, M.D., *Secretary*

HART HOSPITAL, INC., STAFF MEETING

There will be a meeting of the Staff of the Hart Hospital, Inc., 95 Moreland Street, Roxbury, Mass., on Thursday evening, April 5, at 8:30 P.M. Dr. Robert M. Green will speak, and a moving picture of Low Forceps Delivery will be shown.

FAULKNER HOSPITAL CLINICAL MEETING

The next meeting will be held at the Faulkner Hospital at 5:00 P.M. on Thursday, April 5. In addition to the usual clinical pathological conference

Conversely, those of lesser ability tend to gravitate to their own levels in their training. The inherent inequalities of judgment are thus accentuated as the training of the student progresses.

Dr Walker next spoke of the changing attitude which one finds as the young physician advances in his early training. As a student he thinks of disease in terms of pathology and theoretical conceptions. When he reaches the stage of a house-officer, he becomes primarily interested in diagnosis, surgical technique and treatment. But to have the best surgical judgment one must embody all of these phases, each one of which may be emphasized in a certain part of the early experience as a surgeon. The correlation of all the knowledge obtainable regarding the patient will culminate in an accurate diagnosis, and this in turn suggests the treatment of his condition.

The speaker next classified the various types of students which he has met in his teaching experience. The slow, dull, unimaginative student was once the rule, forced as he was into a subjugated mood by his dogmatic teachers. He still exists today, but only because of his own limitations. In former times the cynical student with his omnipresent destructive criticism could only sit by and hold his tongue, whereas he now dares to speak out. He is an adept at tearing down, but seldom suggests constructive measures.

The last type of student is the one in possession of an active imagination coupled with enthusiasm and a practical mind. Any of these qualities alone is admirable, but the combination of all is a rare finding and one of great stimulus to the teacher.

Once the surgeon gets into practice he is faced with either regression or keeping up with recent advances in his field. If he sits by idly he soon finds himself relegated to a back seat, and, as this happens, he becomes a victim to a gnawing inferiority complex which projects motives of persecution into the minds of all who dare to disagree with him.

In regard to conscience, Dr Walker stated that the more primitive a people the more unquestioning its ideas of right and wrong. As civilization advances, qualifications are applied more freely to what was once considered absolute truth. Nevertheless, in medicine there are certain standards as set up by Hippocrates, broad standards, which hold through the ages.

Among the pitfalls awaiting the young surgeon none is worse than the appetite of the laity for showmanship. That the public enjoys this mean quality cannot possibly excuse it in a physician. We should expect a fair monetary return for our services, but not aim at riches. If we aim primarily at service to mankind, the material will be added as a natural course of events.

The chaotic state of recent years makes one look toward the future for uncertain changes. As young surgeons we should be watchful of important political events which may affect our entire order of medical practice.

BOSTON ORTHOPEDIC CLUB

The Annual Meeting of the Boston Orthopedic Club was held in Sprague Hall at the Boston Medical Library on Monday, January 15, 1934. The following officers were elected for the ensuing year:

President—Dr William A. Rogers

Secretary-Treasurer—Dr Sumner H. Roberts

Member of Executive Committee—Dr G. E. Haggart.

Drs John G. Arent, J. B. Webster, John H. Sweet, Jr., Frank S. Jones, William T. Green, Robert J. Joplin, Francis R. Burkner, and Fred Manley were elected to membership.

The principal speaker of the evening was Dr Clay R. Murray of the Columbia Medical Center in New York, who has just returned from a year's study of the Orthopedic Clinics of Europe. Dr Murray began his address by comparing in a general way the work going on in Europe with that in this country and then went on to talk specifically about the various clinics he visited. European Orthopedics, the speaker believes, is in a more static state than the work in this country. The viewpoint tends toward the more conservative and leaves to time and nature many things we operate upon here. The most important element in the difference is thus the element of time, which means much less outside the United States. Another factor in the difference is the type of patient treated, the one in Europe belonging to the "indigent poor" class rather than the "white collar" group here. The European patient is also much more apt to be unquestioning in his obedience to the doctor's wishes. A third important factor in the difference between Europe and America is the economic situation. On the continent, at least, the institutions cannot afford the nursing care, food, apparatus, etc., that are found in this country. A fourth difference is the very important one of surgical technique. Low grade infection in wounds is very common in Europe. A five-minute scrub for an arthroplasty, as well as operating with out gloves, mask, or cap is the rule in the large clinics abroad. Furthermore, there are great differences in opinion as to what is a good result, in Europe and America and the speaker believes there is considerably less free and open discussion of principles of treatment in Europe. The dictum of the chief of service holds absolutely over there with very little chance for argument or discussion.

Dr Murray then discussed the specific clinics. He spent much time with Putti in Bologna, where spinal fusions are never done in tuberculosis of the spine because the mortality is too high and the abundant use of skeletal traction in fractures, even of the clavicle were highlights. Open reduction for congenital dislocation of the hip is never done in Bologna. Retentive rather than corrective jackets are employed in the treatment of scoliosis.

Several of the clinics in Vienna were next visited, and then Munich and England, conditions in the last country being much the same as they are here.

suspected brain tumor and refer it at once to his consultant. To the three specialists just mentioned and to advanced students it will be of far more than passing interest.

The Peninsula of Yucatan — Medical, Biological, Meteorological and Zoological Studies By GEORGE CHEEVER SHATTUCK and collaborators Published by the Carnegie Institution of Washington Washington D C 1933 516 Pages

It is impossible in a short review to do justice to this extraordinarily thorough study of the Peninsula of Yucatan. Intended primarily as a medical survey, it is in reality far more than this since a large part of the volume deals with general conditions physical, political and cultural. We venture to say that this volume will serve for many years as a guide and reference book for travelers and specialists whose interests carry them to Yucatan and that it will eventually take its place among the historical documents dealing with that country.

The volume is divided into four parts in which the first deals with miscellaneous material such as geography, population, administration and the aboriginal culture and customs of the Indian population. This section is extremely interesting reading. It is written in a simple narrative style far superior in this respect to most reports of this kind. Dr. Shattuck, who is responsible for almost all of this part of the book, has shown extraordinary breadth of interest and has created in this section a comprehensive background for the more technical medical observations which follow.

Part II deals chiefly with the medical survey. It includes a chapter by Goodner on bacteriological and serological observations, one by Sandground dealing with helminthology and protozoology and one describing the studies of Shattuck and Benedict on the blood and basal metabolism of the Indians. The great mass of the material presented defies analysis in a short review. One is impressed with the completeness of the plan in which nothing within the range of possible medical interest has been omitted. There is a general survey of prevalent diseases with both clinical and laboratory data, water supply and general sanitary conditions are described. There is a study of animal parasites of man and domestic animals and an account of the history of epidemic diseases. Among the specific observations which seemed of particular interest to the present reviewer are the following: Goodner's determination that 97.7 per cent of the pure Mayas belong to the O blood group is the highest percentage of group O recorded for any race of people and extends and corroborates the observations of preceding investigators. Anthropologically this information is particularly valuable because there was in these studies more opportunity in racial selection of the individuals typed than there has been in previous ones.

Of extraordinary interest to the student of in-

fectious diseases are the pages on syphilis which represent an important addition to the study of this disease. During the first Yucatan expedition, an unusually low percentage of clinically recognizable syphilitic lesions was noticed among the Indians examined in the routine clinics. Subsequent studies confirmed the preliminary observation and in the final summary of the subject, it is stated that among twelve hundred individuals examined, including Mayas and Mestizos not more than 0.2 per cent showed any signs of active syphilis. No chronic syphilitic lesions and no parasyphilis were found in either race. In a total of three hundred and seventy Kahn tests performed on presumably pure Mayas of the Chichen Itzá race not a single positive reaction was obtained. That this condition cannot be attributed to racial immunity is apparent from the fact that about seven per cent of the Mayas of the Valladolid region showed some evidence of syphilitic infections. However, neither in Maya nor in Mestizo was there much clinical evidence and the diagnosis rested mainly on serological tests. That syphilis runs an unusually mild course in these races is clear from the data submitted. In a description of these observations there is included an extensive and well documented review of the literature dealing with racial problems in syphilis and bearing on the suggested American origin of the disease. As far as we are aware this is the most thorough study of syphilis so far made in a relatively pure aboriginal American group in which racial clinical and laboratory data have been reliably coordinated.

The section on epidemic diseases in general is thorough and instructive but includes a little too much about the ordinary textbook knowledge of these infections which has little bearing on the problems of Yucatan.

There is a chapter by Margaret Hilferty and Helen Maher on vital statistics and another on the geography of the region by Dr. John L. Page.

Part III, written by Dr. Saunders and Dr. Cornell, deals particularly with the studies of malaria and amoebiasis. It is surprising that malaria is relatively scarce in Yucatan even in the rainy seasons. Although according to Hofman, *Anopheles* occur in Yucatan, a single variety of the existing ones, *Anopheles albimanus*, seems the only one capable of transmitting malaria. Even these must be scarce since Saunders and Cornell could find none in spite of frequent searches.

In contrast to the scarcity of malaria is the enormous prevalence of *Endamoeba histolytica*. Nineteen and five-tenths per cent of all persons examined were found to harbor the amoeba, the estimated incidence of infected being about forty per cent.

The final section, Part IV, consists of three chapters: the first by Bequaert, on the botany of Yucatan; the second by Bequaert and Clench, on non-marine mollusks; and the third by Bequaert,

on the cases which have come to autopsy during the month Dr Edward L. Young, Jr., will give a short talk on "Some of the Difficulties of Gallbladder Diagnosis" All physicians who are interested are cordially invited

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

April 5—Faulkner Hospital Clinical Meeting See page 715

April 5—Hart Hospital Inc Staff Meeting See page 715

April 5—New England Hospital for Women and Children See page 715

April 10—Harvard Medical Society See page 715

April 11—New England Dermatological Society will meet at the Boston City Hospital at 3 P M

April 13, 20 and 27—Salmon Memorial Lectures See page 443 issue of February 22

April 14—New England Association of the Johns Hopkins Alumni See page 715

April 16—Boston University School of Medicine to Conduct a Clinical Meeting at Boston City Hospital

April 16-20—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House For information write Mr E R Loveland Executive Secretary 133-135 South 36th Street Philadelphia Pa

April 30—The American Board of Dermatology and Syphilology Examinations for Certificates Address Dr C Guy Lane 416 Marlboro Street Boston for details

May 14, 15 16 and 17—Thirtieth Annual Meeting of the National Tuberculosis Association For details apply to the National Tuberculosis Association 450 Seventh Avenue New York City

May 26 27, 28, and 29—The American Association on Mental Deficiency Details may be obtained from the Secretary Dr Groves B Smith Godfrey Illinois

July 24-31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H R Seelitz General Secretary Dr H E Walther Gloriastrasse 14 Zurich

September 3-6—American Public Health Association at Pasadena California Dr J D Dunshee Chairman Local Committee on Arrangements

September 4, 5, 6—International Union Against Tuberculosis See page 715

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday, April 4—Essex Sanatorium Middleton Clinic 5 P M Dinner 7 P M Speakers Dr Elliott P Joslin and Dr Howard F Root Boston Subject Tuberculosis Complicating Diabetes

Thursday, May 3—Censors Meeting at Salem Hospital 3 30 P M

Tuesday, May 8—Annual Meeting Salem Country Club Forrest Street Peabody Dinner at 7 Speaker to be announced Subject to be announced

RALPH E STONE M D Secretary
221 Cabot Street Beverly Mass

FRANKLIN DISTRICT MEDICAL SOCIETY

The next meeting will be held on the second Tuesday of May at the Weldon Hotel Greenfield at 11 A M

CHARLES MOLINE M D Secretary
Sunderland Mass

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The next meeting will take place in May (2nd Wednesday) at Winchester

ALLAN R. CUNNINGHAM M D Secretary
76 Church Street Winchester Mass

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25

T A STAMAS M D Secretary
226 Central Street, Lowell Mass

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

May 3—Censors Meeting See page 715

NORFOLK DISTRICT MEDICAL SOCIETY

April 17—Hotel Kenmore 8 30 P M Special Business Meeting

May—Annual Meeting Time place and program to be announced

FRANK S CRUICKSHANK M D Secretary
1695 Beacon Street Brookline Mass

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

April 5—12 noon at Norfolk County Hospital Speaker Dr Elliott P Joslin Subject Diabetes

May 3—12 noon at Norfolk County Hospital Annual Meeting Election of Officers

N R PILLSBURY M D Secretary
Norfolk County Hospital South Braintree Mass

SUFFOLK DISTRICT MEDICAL SOCIETY

April 25—Annual Meeting at the Boston Medical Library Election of Officers Scientific Program titles and speakers to be announced

The Medical Profession is cordially invited to attend this meeting

JAMES H MEANS M D Vice-President
GEORGE P REYNOLDS M D Secretary
311 Beacon Street, Boston Mass

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows

April 11—Open date

May 9—Annual Meeting Time and place to be announced later

ERWIN C MILLER M D Secretary
27 Elm Street Worcester Mass

BOOK REVIEWS

Benign Tumors in the Third Ventricle of the Brain Diagnosis and Treatment By WALTER E DANDY M D Published by Charles C Thomas 169 Pages Price \$5 00

This monograph concerns itself with one of the least known of the intracranial tumors those arising within the third ventricle These growths have been considered very rare and very difficult to remove

Dr Dandy gives us his experiences with a large number of these unusual cases and outlines clearly the symptomatology or rather the lack of it, and the value of ventriculography as a diagnostic aid He gives us also a graphic picture of his operative technique

The reader will find the discussion of the x-ray work of great value and will do well to follow the reasoning and final localization of the tumor and the variation in the operative approach with considerable care, as the whole subject is quite complicated

The book is clearly and concisely written and the illustrations are excellent, but one must always remember that it is Dr Dandy's tendency to minimize the dangers and difficulties encountered in cranial surgery To one unfamiliar with ventriculography it would appear that the procedure was without danger and as simple as the making of a cystogram, but of course such is not the case The same is true in regard to operative technique

This volume is primarily for the neurosurgeon, the neurologist and the radiologist. These cases are so rare and obscure that the diagnosis will hardly be suspected by the family physician His function on a case of this sort will be to make a diagnosis of

not agree with Dr Landis altogether in some of the categorical statements which he makes in regard to tuberculosis. He infers that accident and injury are never an etiological or causative factor in bringing into activity a hitherto latent tuberculous process and he states definitely that he has consistently refused to testify in such cases. The reviewer believes that this is not the opinion of the majority of authorities in this field. There are far too many instances on record where violent physical exertion or an accident involving an operation, long continued suffering, etc., has apparently at least so lowered the patient's resistance that the tuberculosis which had been in abeyance becomes active. There are many other instances where a man after sudden, severe exercise such as cranking a car or lifting a heavy weight has a hemorrhage which again reactivates tuberculosis. The fact, as he states, that between 50-60 per cent of pulmonary hemorrhages in tuberculosis occur when the patient is at rest or asleep does not in any way prove that the strenuous exertion was not the causative factor in that particular case. The same might apply to his remarks on spontaneous pneumothorax in tuberculosis of which the reviewer can find little mention made or of sudden, severe physical exertion as a cause of the pneumothorax. Likewise, in the differential diagnosis of this condition he does not mention angina pectoris—if it occurs on the left or gall bladder disease or if it occurs on the right—as diagnoses which have not infrequently been wrongly made.

In considering the subject of hemorrhage in the diagnosis of tuberculosis he quotes from the two charts to be found in Cabot's 'Differential Diagnosis,' one based on the figures of Stricker as found in Prussian soldiers and the other on Dr Cabot's own figures taken from the Massachusetts General Hospital. These two charts vary greatly. The reason for this variance which is a most striking one and the reason why Dr Cabot, basing his figures on cases from the Massachusetts General Hospital, differs so much from Dr Stricker undoubtedly lies in the estimation of each man as to what constitutes a pulmonary hemorrhage. The reviewer has every reason to believe that in Dr Cabot's work any particle of blood in the sputum, bloody mucus or indeed bloody saliva which occurs almost invariably in any uncompensated mitral disease and frequently when well compensated constituted a hemorrhage. This is probably the reason why the incidence of hemorrhage in his cases in the course of mitral disease was so high. If bleeding to constitute a hemorrhage was based on the generally accepted standard of at least one teaspoonful of clear blood, it is greatly to be doubted if mitral disease would rank particularly high as a causative factor.

Such comments as this, which can hardly be called criticism might be made in regard to other parts of the book. This would naturally be the case, at least so far as the sections written by Dr Landis are concerned for the simple reason that he has very definite opinions on the subjects and

does not hesitate to state them. The volume, however is one of the very highest order and will be an addition to the library of any physician.

The Cyclopedia of Medicine Editor in Chief, George Morris Piersol Assistant Editor, Edward L. Bortz To be completed in 12 Vols Published by F. A. Davis Company Philadelphia Price \$120.00

The latest addition to the "medical system" family is the *Cyclopedia of Medicine*, edited by George Piersol and Dr Edward Bortz. The editor credits the late Dr Charles Sajous with laying the foundation for the present work in his *Analytic Cyclopedia of Practical Medicine*, although the present *Cyclopedia* is in every other way independent of Dr Sajous's *Cyclopedia*. The forthcoming *Cyclopedia* will consist of twelve large (octavo) volumes, well printed and substantially bound. The contents are arranged in alphabetical order, beginning with 'Abdomen, Acute'. Each item is written by an acknowledged authority on the subject. Particular attention has been paid to recent advances in medicine, surgery, and the fundamental sciences (physiology and chemistry), and various phases of the social aspects of medicine, such as workmen's compensation, industrial medicine, legal medicine and social service are also included.

In the various subjects looked up by the reviewer, the information which he sought was readily found. The presentation of each subject is full but not cluttered with unnecessary details. The text is illustrated, not profusely, but in such a way that each illustration has a practical value. Many of the sections contain brief abstracts of important original articles, and bibliographies of the recent outstanding contributions.

In getting together the material for the *Cyclopedia*, the authors have done a splendid job. The uniformity of style and presentation, the thoroughness and practical nature of the work, make it an outstanding contribution to medical literature.

Obstetrics and Gynecology Edited by Arthur Hale Curtis M.D., with 1664 Illustrations Volume III Philadelphia and London. W. B. Saunders Company, 1933 Price \$35.00 per set.

The third and last volume of *Obstetrics and Gynecology* edited by Curtis, with the index, comes to the reviewer. This volume starts with Section XIV, Chapter LXIV. The first four chapters are taken up with discussions on "Displacements and Relaxations." Baer, Farrar and Ward give three excellent chapters with good pictures of the operative techniques which they recommend for pelvic repair work.

Section XV is on "Disturbances of Function." Miller has a satisfactory article on "Dysmenorrhea," and Novak has four excellent chapters on "Uterine Hemorrhage," "Abnormalities of the Menstrual Rhythm," "Amenorrhea," and "Disturbances of the

dealing with entomology is of considerable importance to all who are to deal with insect borne diseases in that country

The volume is profusely illustrated with excellent and wisely selected photographs, and contains one large map

In looking over the book, one is impressed particularly with the excellent organization of the study, the splendid coöperation of the specialists responsible for it and with the simple and clear manner in which the material has been put together. The volume will gain in importance as time goes on since it represents a complete and accurate description of the conditions in a region in which the next fifty years will inevitably bring about fundamental changes. It appears also at a particularly appropriate time when there is an increasing appreciation, among Americans, of the vigor and intelligence with which progress is being made by our southern neighbors in the organization of a huge territory

Dr Shattuck's book represents the type of comprehensive and sympathetic study which is perhaps the most useful kind of contribution which we can make in coöperation with friendly neighbors who are faced with tasks not unlike those which faced the American people one hundred years ago

A Text Book of Medicine By 141 American Authors
Edited by Russell L Cecil, and Associate Editor
Foster Kennedy Third Edition Published by
W B Saunders Company 1664 Pages Price
\$9 00

This one volume work, which, since 1927, has gone through three editions and about ten printings, has without much doubt become the foremost and most widely favored of American texts on Internal Medicine. This is due, not alone to its compact method of presentation, but to its highly authoritative character. In a volume written by 141 authors, there can naturally be no uniformity of excellence. The few old fashioned and pedantic chapters stand out conspicuously among the bulk of excellently written treatises, characterized usually by their modern emphasis on the physiological principles underlying disease. Unfortunately, this does not hold true for the section dealing with jaundice and diseases of the liver

The outstanding chapters are so numerous that merely to enumerate them would be to fill the page. The 246 page section of the diseases of the nervous system, edited by Foster Kennedy, is one of the features of the volume. The reviewer was especially struck by the chapters on the Neuroses by Wechsler, that on Syphilis of the Central Nervous System by Solomon, and that on the Diagnostic Significance of the Cerebrospinal Fluid by Ayer. The section dealing with the Diseases of the Blood might have been far better had it been written by fewer authors. Reznikoff's chapter on Anemia is deficient, that on Pernicious Anemia by McCann is not authoritative,

and that on the Leukemias is poorly classified. Minot and Buckman's articles stand out here brilliantly. The important section on Diseases of the Heart is unusually good, particularly in chapters by Hamburger and Katz on the Cardiac Arrhythmias, and by Eggleston on Cardiac Failure. It is interesting, and not a little amusing, to see that Sprue is still described (by Ashford) as a fungous disease and that Castle's concepts of the disease are completely ignored. However, one must really go out of one's way to find fault with this excellent volume which does great credit, not only to its editor, Russell L Cecil, but to American medicine in general. May it long live!

Diseases of the Chest and the Principles of Physical Diagnosis By GEORGE W NORRIS and HENRY R. M. LANDIS Fifth Edition Published by W B Saunders Co 997 Pages Price \$10 00

This book, one of our best works on diagnosis of diseases of the heart, lungs, etc., now appears in a well merited fifth edition. It is one of the large "ten pound, 1000 page, ten-dollar" variety but here at least the physician who purchases this volume will get his money's worth. It is made up of four parts. Part I, examination of the lungs by Dr Norris containing twelve chapters with a special one by Dr Charles M Montgomery on "The Transmission of Sounds Through the Chest." Here Dr Norris discusses in detail the methods of examining the lung with the exception of the x ray. There is a valuable chapter on the physical findings in infants and young children.

Part II, again by Dr Norris, is on the examination of the circulatory system and contains eight chapters with a special one by Dr Edward B Krumhaar on "The Electrocardiograph."

Part III is by Dr Landis with four chapters, the greater part of which is devoted to diseases of the lungs although diseases of the bronchi, pleura and diaphragm are included. Naturally enough, there is much space in this part devoted to the general subject of tuberculosis.

Finally, Part IV, again by Dr Landis and Dr Norris, with seven chapters on diseases of the pericardium, the heart and aorta. Under the heart they discuss diseases of the myocardium, endocarditis, congenital heart disease, with a special chapter on angina. There is an excellent index and the whole volume is replete with plates, particularly of pathological specimens, photographs of patients, showing the technique of examination of the patient, charts and diagrams.

Such a monumental work as this does not admit of a detailed review. It is so full of information of all kinds that the reviewer stands aghast at the colossal amount of time, strength and energy that must have been spent not only in accumulating information but in presenting it in such remarkably clear form. There is everything to admire and little or nothing to criticize. For instance, one can-

topics discussed are the energy requirements of adults, protein as body building material, mineral elements and water as regulators of bodily processes the vitamins the contribution of special foods to diets adequate diets for adults and children and suitable foods for mothers with infants Tables of the vitamin content and mineral shares of foods of the normal weights and heights of men women boys and girls of various ages and of the energy cost of activities are listed in the appendix While the book is intended for those who wish to live intelligently little consideration is given to the acid base balance of foods or obviously erroneous ways of eating The book is especially useful for students of dietetics and also for nutrition workers

La Diathermie et ses Applications Médicales By LE DOCTEUR PAUL DUCHET Second Edition revised and enlarged Paris — Gauthier-Villars Éditeur 1933 Price 20 fr

In the words of the authors introduction this work is written to render the study of diathermy in its medical applications accessible to all physicians Such an end is furthered by the avoidance of detailed physical theory and by the careful exposition of the technique of application and the necessary precautions against injury When the author is describing the therapeutic results obtained in the conditions admittedly amenable to diathermy he is on sure ground and his suggestions drawn from his own practice are of value In other diseases where the value of diathermy is debatable he is inclined to quote non-critically from the experiences of others thus vitiating his purpose of setting down facts only in his own experience Examples include the treatment of hyperhidrosis by transmedullary diathermy and of menopausal arthritis by diathermic treatment of the pelvic organs The absence of a bibliography is a handicap to the critical reader The newer developments in hyperpyrexia by high frequency currents are given a brief summary drawn again from the experiences of others and not in sufficient detail to enable the physician to make use of them

Annals of Roentgenology A series of Monographic Atlases Volume Fifteen Edited by James T Case *Nasal Accessory Sinuses* By FREDERICK M LAW Published by Paul B Hoeber Inc 215 Pages Price \$10 00

This is volume fifteen of the *Annals of Roentgenology* edited by James T Case and written by Frederick M Law an outstanding authority on the diagnosis of Diseases of the Nasal Sinuses Like all volumes of this series it is profusely illustrated The author's technique is given in detail

There is a chapter on the anatomy of the nasal sinuses In the chapter on Interpretation the author describes the method to be adopted in the examination of sinus films and the reporting of the findings

In detail There is a special chapter on diseases of the nasal sinuses in children

The book is particularly valuable as a record of the observations and experience of a keen student of this branch of roentgenology over many years

Étude et Traitement de la Meningite Tuberculeuse By THÉRÈSE A. JOUSSOT Published by Masson et Cie Paris 152 Pages Price 30 francs

Tuberculous meningitis is usually considered a fatal disease Cases in the literature which are reported as having recovered are usually looked upon as somewhat doubtful in their diagnosis It is easy to confuse this form of meningitis with the so-called aseptic lymphocytic meningitis In the latter disease there is a high degree of recoverability It therefore becomes very difficult to evaluate any form of treatment under these circumstances The author of this monograph states that in a number of cases of tuberculous meningitis where the diagnosis has been confirmed by the finding of acid fast tubercle bacilli by guinea pig test she has effected a cure by the use of a substance called allergine The work is still under debate in France and a definite conclusion cannot be drawn from this monograph The book however is of value in that the pathology of the disease is carefully described and a number of experimental researches recorded Further work will be necessary before the treatment of tuberculous meningitis with allergine can be accepted

What Shall I Eat? By EDITH M BARBER The Macmillan Co New York 1933 Price \$1 75

This small book embellished with comic illustrations describes in a chaty style phases of a woman's disposition and appearance especially, that are influenced by the food consumed and the ways of eating Other topics discussed are the business man's lunch dietetic fads food prejudices and the cost of food And in the appendix are tables of height and weight for men and women, of one hundred calorie portions of foods and of the elements minerals ash reaction and vitamin in foods The book is evidently intended for the laity

De Venarum Ostiis 1603 of Hieronymus Fabricius of Aquapendente (1537 1619) By K. J FRANKLIN DM Springfield Ill and Baltimore Md Charles C Thomas 1933 98 pages

Dr Franklin of Oxford England, has made a splendid contribution to the history of medicine By reprinting a rare book with an adequate translation he has brought to the attention of the medical world the importance of the studies made by Fabricius Although Fabricius was not the first to discover the valves in the veins he at least should receive the credit for making their presence an acknowledged fact in anatomy As Dr Franklin truly says The true inventor is he who definitely places the world in

Menopause" Also Rubin has a very complete chapter on "Sterility"

Section XVI is on "The Endocrines in Gynecology and Obstetrics, and it seems to the reviewer one of the best accounts that has appeared in English, summing up the entire present status of the endocrines

Section XVII is headed "Special Diseases and Important Symptom Complexes," six chapters on entirely unrelated subjects which had to be included in the book and so apparently have been grouped in this section. The chapter on "Endometriosis" gives due credit to Sampson for his work on this subject, and the authors take a decidedly conservative stand in the treatment of this condition. Anspach's article on "Ectopic Pregnancy" is well done. Davis's chapter on "Leukorrhea," although in many ways complete, lacks specific details which are so essential for the satisfactory treatment of this annoying condition.

Section XVIII, "Other Gynecological Diseases and Symptom Complexes," contains another group of more or less unrelated headings. Chapter LXXXV on "Lesions of the Cervix" by Holden is excellent and well illustrated. Taussig has four chapters on diseases of the vagina and the vulva which are most comprehensive. Irving has a chapter on "Inversion of the Uterus, Acute and Chronic," and the section ends with "Congenital Malformations of the Genital Tract."

Section XIX is headed "Special Topics," and contains thirteen chapters on various subjects including those on the appendix in relation to gynecology, urinary tract infections, x-ray in obstetrics and gynecology, radiotherapy, blood transfusion, anesthetics and analgesics, and psychiatry and internal medicine in relation to obstetrics and gynecology. They are all commendable in most respects. Curtis's two articles entitled "The Gynecological Patient Presents Herself" and "The Early Months of Pregnancy from a Gynecological Aspect" are especially interesting. Counseller's article in regard to the appendix is timely and well done. The chapters on anesthetics, hypnotics and analgesics could well be combined and the statements about hypnotics and analgesics made more specific.

The book ends with a satisfactory index, and there is a small book separately bound as a general index to the three volumes.

Now that the complete work is published, one can evaluate it, and the tremendous amount of time and labor necessarily expended by the editor is at once apparent. The correlation on the whole is good, but there are many contradictory statements and for the student this may prove very disconcerting. Throughout the three books the authors refer to other articles in the volumes under various chapter numbers. It would be a great improvement if in future editions these references were made to the volume and page, for it is troublesome to find the reference by the chapter number alone.

The volumes are beautifully constructed, and have very few typographical errors. They are a valuable addition to our obstetrical and gynecological literature, and an excellent exposition of American obstetrics and gynecology.

Red Medicine Socialized Health in Soviet Russia
By SIR ARTHUR NEWSHOLME and JOHN ADAMS
KINGSBURY Garden City New York Doubleday,
Doran & Company, Inc., 1933 324 Pages Price
\$2.50

The authors of this volume traveled through Soviet Russia in August and September, 1932, making an investigation of socialized medicine for the Milbank Memorial Fund. This book, therefore, is a report of their trip, for it not only gives a general picture of Russian life as they saw it, but there are concluding chapters giving the details of medical care of the Russian people. The facts are presented in an impartial way, although attempt at an evaluation is made in the final chapter.

Medicine in Russia is completely socialized. No patient pays anything for services either from the doctor or the hospital, from the time of his birth until death. All doctors and other employees are State officials receiving compensation for their services, with their hours of work limited and holidays granted to them exactly as they are given to any other laborer. Theoretically all patients receive the same degree of skill and attention. There have been many new hospitals built and in general it would seem that the care of the average Russian today is far better than under the old régime. This form of medical service seems to be particularly applicable to a country where a large part of the population are below the average of civilization, for only a few of Russia's millions can even read or write. The doctors, too, are better off in general, than they were before the Revolution. There is, however, a great scarcity of physicians and not enough medical schools to train them. These deficiencies are rapidly being overcome.

The book, written in a semi-popular style, is authoritative so far as it can be. The opinions of two observers, neither of whom could speak the language, cannot necessarily be entirely relied upon. One rather suspects that they were shown only the best of Russian medicine and missed some of its worst features. As a document, however, from two men well trained to observe conditions in general, this book is a valuable contribution. The pictures add very little to its worth.

The Foundation of Nutrition By MARY S. ROSE
Revised Edition Published by The Macmillan Company
630 Pages Price \$3.00

In the second edition of Professor Rose's book, nutrition is presented largely from the metabolic point of view, yet not in technical language and is intended for those without a highly specialized training who "wish to live intelligently." Some of the

full possession of knowledge and of facts of which one can every day and at will verify the reality and accuracy" The book contains, in addition to the facsimile reprint of Fabricius volume and the translation, a brief biographical notice of the author, an historical summary of the earlier work on venous valves, notes on the anatomical theatre at Padua where Fabricius taught, and a bibliography of the important contributions to this subject. The book is splendidly reproduced, with the superb plates of the first edition Unfortunately they are rather reduced in size, which detracts somewhat from their original form

A Study of Rural Public Health Service By ALLEN W FREEMAN Published by The Commonwealth Fund, London 236 Pages Price \$2 50

The survey, the results of which are recorded in the two hundred pages of this book, represents an effort to compile information regarding public health promotion activities in rural districts with a view to obtaining data which might serve as a basis for estimating the relative value of methods employed in accomplishing their desired objects

This survey followed similar efforts to "appraise" the methods of State and Municipal Health Departments

The information presented in the book was obtained both by personal investigations and by questionnaires It has been carefully arranged and is well calculated to show a rural community how others are endeavoring to meet health problems similar to its own.

The Diseases of Infants and Children By J P CROZER GRIFFITH and A. GRAEME MITCHELL. Published by W B Saunders Company 1155 Pages Price \$10 00

The third edition of this textbook is regarded, as formerly, one of the standard authorities on diseases of infants and children It merits its position because of its comprehensive exposition of the subject, the wide experience of the authors, and the singularly well-composed bibliography The authors have been unusually successful in bringing the subject matter up to the present-day conceptions in this field This textbook is recommended without hesitation to all medical students and practitioners interested in the general problems of pediatrics This edition is well edited and well illustrated

BOOKS RECEIVED FOR REVIEW

Mental Hygiene in the Community by Clara Bassett Published by The Macmillan Company 394 Pages Price \$3 50

Annual Report of the Surgeon General, U S Army, 1933 Published by The United States Government Printing Office, Washington 222 Pages

Modern Clinical Psychiatry by Arthur P Noyes Published by W B Saunders Company 485 Pages Price \$4 50

The Lyophilic Colloids by Martin H Fischer and Marian O Hooker Published by Charles C Thomas 246 Pages Price \$4 50 postpaid

American College of Surgeons Twenty First Year Book, 1934 Published by The Lakeside Press, Chicago 1170 Pages

Annual Report of the Surgeon General of the Public Health Service of the United States For the Fiscal Year 1933 Published by The United States Government Printing Office, Washington, 1933 11 Pages Price 75 (cloth)

Social Psychology by Abraham Myerson Published by Prentice-Hall, Inc 640 Pages Price \$3 50

A System of Clinical Medicine by Thomas Dix Savill Edited by Agnes Savill, assisted by E Warner Ninth Edition Published by William Wood & Company 1063 Pages Price \$9 00

Human Embryology and Morphology by S Arthur Keith Fifth Edition. Published by William Wood & Company 558 Pages Price \$10 00

Fundamentals of Biochemistry by T R Parsor Fourth Edition Published by William Wood Company 435 Pages Price \$3 00

Birth Control in Practice Text and Tables by Marie Kopp Prepared under the supervision of a scientific advisory committee Published by Robert J McBride & Company 290 Pages Price \$3 75

America Self Contained by Samuel Crowther Published by The Chemical Foundation 340 Pages

Studies from The Rockefeller Institute for Medical Research Reprints Volume 87 Published by The Rockefeller Institute for Medical Research, 1933 658 Pages

Fifty Sixth Annual Report of the Department Health of the State of New Jersey 1933 Printed by MacCrellish & Quigley Company 418 Pages

Wilhelm Conrad Röntgen and the Early History of the Roentgen Rays by Otto Glasser, with a chapter by Margaret Boverl Published by Charles C Thomas 494 Pages Price \$6 00

Die Digitalisbehandlung von Prof Dr Ernst Edens Published by Urban & Schwarzenberg Berlin und Wien 1934 154 Pages

Treatment of the Commoner Diseases by Lowell F Barker Published by J B Lippincott Company 319 Pages

Text Book of Pathology by Robert Muir Thirtieth Edition Published by William Wood & Company 957 Pages Price \$10 00

